ORIGINAL

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

November 17, 2004

FERC Project No. 2433 -061

Ms. Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
Mail Code: DTCA, HL 21.3
888 First Street, N.E.
Washington, DC 20426

Dear Secretary Salas:

Grand Rapids Hydroelectric Project Water Quality Monitoring Data

As per the Order Approving Water Quality Monitoring Plan, dated April 7, 1999, Wisconsin Public Service Corporation (WPSC) is pleased to submit water quality-monitoring data for the 2004 monitoring year.

Per the water quality-monitoring plan for the Grand Rapids Hydroelectric Project, dissolved oxygen (D.O.), temperature, and pH were monitored at two locations on the Menominee River. The first monitoring location was upstream of the Grand Rapids Dam and the second was in the powerhouse tailrace.

The monitoring at the Grand Rapids Hydroelectric Project was scheduled to occur hourly from June 1st to September 30th, 2004. Please note that water quality monitoring was ended on August 2, 2004, due to the power canal being de-watered for maintenance purposes. WPSC has consulted with the Michigan Department of Natural Resources (MDNR), Wisconsin Department of Natural Resources (WDNR), and the U.S. Fish and Wildlife Service (FWS) about the water quality monitoring data. It has been determined that water quality monitoring will occur again in August and September of 2005 in an effort to collect water quality monitoring data for the time period that could not be collected in the 2004 monitoring year.

There are no deviations from water quality standards to note. Copies of the raw D.O., temperature, and profile data are included in Appendix A. Copies of pre- and post-deployment calibration data are included in Appendix B. Documentation of Agency Consultation is included in Appendix C.

If you have any questions, please do not hesitate to call Mr. Mark Metcalf at (920) 433-1833.

Sincerely,

Terry P. Jensky
Assistant Vice President - Energy Supply Operations
for Wisconsin Public Service Corporation
Telephone: (920) 433-2277

Enc.

cc: Mr. Gil Snyder, WPSC - D2
Mr. Shawn Puzen, WPSC - D2
Ms. Peggy Harding, FERC - Chicago
Ms. Joan Johanek, WPSC - D2 (file)
Mr. Bill Bloczynski, WPSC - MERH (cover only)
Mr. Larry Thompson, FWS
Ms. Jessica Mistak, MDNR
Mr. Mike Donofrio, WDNR
Mr. Bruce Crocker, WPSC - D2 (cover only)

Appendix A

2004 Water Quality Monitoring Data

Wisconsin Public Service Corp.
Grand Rapids Hydroelectric Project
Dissolved Oxygen, pH and Water Temperature Data
FERC N0. 2433

Date MMDDYY	Time HHMMSS	Tailwater Temp oC	Tailwater pH Units	Tailwater DO% Sat	Tailwater DO mg/l	Headwater Temp oC	Headwater pH Units	Headwater DO% Sat	Headwater DO mg/l
60104	0	13.57	7.82	82.2	8.34	13.54	7.65	82.5	8.40
60104	10000	13.56	7.82	82.0	8.33	13.51	7.65	82.9	8.44
60104	20000	13.57	7.82	82.4	8.37	13.49	7.64	83.0	8.46
60104	30000	13.58	7.83	82.0	8.33	13.48	7.64	82.8	8.44
60104	40000	13.58	7.83	82.5	8.37	13.46	7.63	82.6	8.42
60104	50000	13.59	7.83	81.8	8.30	13.46	7.66	82.5	8.41
60104	60000	13.60	7.83	82.3	8.35	13.45	7.65	81.9	8.35
60104	70000	13.61	7.83	81.6	8.28	13.46	7.64	82.0	8.36
60104	80000	13.62	7.83	82.5	8.37	13.49	7.65	82.1	8.36
60104	90000	13.64	7.83	82.7	8.38	13.52	7.63	81.1	8.26
60104	100000	13.62	7.84	82.9	8.41	13.54	7.63	81.3	8.28
60104	110000	13.64	7.84	82.8	8.39	13.58	7.64	82.1	8.35
60104	120000	13.67	7.84	83.3	8.44	13.67	7.65	82.5	8.37
60104	130000	13.75	7.85	83.6	8.45	13.77	7.64	82.8	8.38
60104	140000	13.90	7.85	84.8	8.55	14.01	7.65	83.4	8.40
60104	150000	13.96	7.85	84.4	8.50	14.12	7.65	83.3	8.37
60104	160000	13.87	7.85	85.0	8.58	14.05	7.67	84.5	8.51
60104	170000	13.86	7.85	85.0	8.57	14.02	7.67	85.3	8.59
60104	180000	13.90	7.85	85.1	8.58	14.04	7.68	85.4	8.60
60104	190000	13.86	7.85	85.0	8.58	14.02	7.67	85.1	8.57
60104	200000	13.80	7.84	85.6	8.65	13.96	7.68	85.7	8.65
60104	210000	13.74	7.84	85.0	8.59	13.88	7.67	84.7	8.56
60104	220000	13.69	7.84	84.8	8.58	13.82	7.67	84.3	8.53
60104	230000	13.66	7.84	84.7	8.58	13.76	7.66	84.0	8.51
60204	0	13.63	7.84	84.8	8.60	13.72	7.66	84.0	8.52
60204	10000	13.59	7.84	85.4	8.66	13.66	7.66	84.6	8.58
60204	20000	13.54	7.84	85.1	8.64	13.60	7.66	84.5	8.59
60204	30000	13.49	7.84	85.1	8.66	13.53	7.66	84.6	8.61
60204	40000	13.42	7.84	84.8	8.63	13.46	7.68	84.4	8.61
60204	50000	13.34	7.85	85.4	8.71	13.37	7.66	84.3	8.61
60204	60000	13.25	7.85	85.3	8.72	13.28	7.64	83.5	8.54
60204	70000	13.18	7.85	84.7	8.67	13.21	7.68	84.2	8.63
60204	80000	13.19	7.85	85.2	8.73	13.21	7.63	84.3	8.65
60204	90000	13.27	7.85	86.6	8.85	13.30	7.66	86.0	8.80
60204	100000	13.42	7.86	86.8	8.84	13.48	7.67	83.9	8.55
60204	110000	13.64	7.86	87.6	8.88	13.73	7.65	84.3	8.55
60204	120000	13.90	7.86	86.6	8.73	14.06	7.64	83.8	8.44
60204	130000	14.15	7.87	88.3	8.85	14.38	7.65	84.8	8.47
60204	140000	14.36	7.87	88.7	8.85	14.70	7.66	86.1	8.54
60204	150000	14.55	7.87	89.6	8.90	14.97	7.67	88.0	8.68
60204	160000	14.62	7.86	89.1	8.84	15.08	7.68	88.0	8.66
60204	170000	14.69	7.87	89.4	8.86	15.15	7.68	88.2	8.67
60204	180000	14.67	7.87	89.1	8.83	15.18	7.69	88.8	8.72
60204	190000	14.62	7.86	89.0	8.83	15.11	7.68	88.6	8.71
60204	200000	14.53	7.85	88.9	8.83	14.98	7.68	88.4	8.72
60204	210000	14.38	7.84	88.7	8.85	14.82	7.68	88.4	8.75
60204	220000	14.32	7.84	87.1	8.70	14.68	7.67	87.4	8.68

60204	230000	14.27	7.83	88.0	8.79	14.57	7.67	87.3	8.68
60304	0	14.23	7.83	87.5	8.76	14.50	7.65	86.8	8.65
60304	10000	14.18	7.83	88.3	8.84	14.41	7.65	86.3	8.62
60304	20000	14.11	7.82	87.6	8.79	14.32	7.65	86.7	8.68
60304	30000	14.04	7.82	87.9	8.83	14.23	7.64	85.1	8.53
60304	40000	13.96	7.82	86.4	8.70	14.13	7.64	85.9	8.63
60304	50000	13.88	7.82	86.8	8.75	14.04	7.63	85.0	8.56
60304	60000	13.81	7.82	86.7	8.75	13.94	7.63	85.0	8.57
60304	70000	13.75	7.82	86.5	8.74	13.87	7.63	84.3	8.51
60304	80000	13.77	7.82	87.2	8.81	13.87	7.63	85.2	8.61
60304	90000	13.87	7.82	87.4	8.82	13.95	7.63	84.8	8.55
60304	100000	14.05	7.83	87.0	8.74	14.14	7.63	83.9	8.43
60304	110000	14.26	7.84	88.2	8.82	14.37	7.62	83.8	8.37
60304	120000	14.50	7.84	88.7	8.82	14.66	7.62	83.7	8.31
60304	130000	14.75	7.84	88.3	8.73	14.95	7.61	83.5	8.24
60304	140000	15.01	7.84	88.4	8.69	15.26	7.61	84.1	8.24
60304	150000	15.22	7.85	88.7	8.68	15.58	7.63	86.1	8.38
60304	160000	15.36	7.85	89.9	8.78	15.75	7.64	87.2	8.46
60304	170000	15.44	7.85	89.9	8.76	15.86	7.65	88.3	8.54
60304	180000	15.44	7.85	90.2	8.79	15.86	7.65	88.2	8.53
60304	190000	15.38	7.85	89.3	8.71	15.77	7.66	88.3	8.56
60304	200000	15.27	7.84	90.1	8.81	15.67	7.66	87.8	8.53
60304	210000	15.16	7.83	89.7	8.80	15.53	7.65	87.1	8.49
60304	220000	15.06	7.83	87.7	8.62	15.39	7.65	86.4	8.44
60304	230000	15.00	7.83	88.6	8.72	15.30	7.65	87.1	8.53
60404	0	14.95	7.83	88.7	8.74	15.20	7.64	86.4	8.49
60404	10000	14.88	7.83	88.7	8.75	15.11	7.65	87.1	8.57
60404	20000	14.82	7.83	88.1	8.70	15.02	7.65	87.2	8.59
60404	30000	14.76	7.83	89.0	8.80	14.91	7.65	87.4	8.63
60404	40000	14.67	7.83	88.4	8.76	14.82	7.65	87.1	8.62
60404	50000	14.59	7.83	88.1	8.75	14.73	7.62	84.6	8.39
60404	60000	14.51	7.83	87.2	8.67	14.62	7.64	85.1	8.46
60404	70000	14.46	7.83	87.7	8.73	14.55	7.63	84.4	8.40
60404	80000	14.48	7.84	87.0	8.66	14.55	7.63	84.4	8.41
60404	90000	14.57	7.84	88.3	8.77	14.64	7.63	85.0	8.44
60404	100000	14.70	7.84	87.5	8.66	14.80	7.64	85.4	8.45
60404	110000	14.92	7.85	87.6	8.64	15.03	7.64	85.2	8.40
60404	120000	15.18	7.85	88.7	8.69	15.30	7.63	84.3	8.26
60404	130000	15.44	7.86	89.5	8.72	15.62	7.63	85.9	8.36
60404	140000	15.66	7.85	89.3	8.67	15.91	7.63	85.3	8.25
60404	150000	15.88	7.86	89.6	8.65	16.14	7.64	86.2	8.29
60404	160000	16.03	7.86	89.7	8.63	16.33	7.64	87.4	8.38
60404	170000	16.13	7.86	90.2	8.66	16.45	7.64	87.5	8.36
60404	180000	16.12	7.86	89.2	8.57	16.51	7.67	89.6	8.56
60404	190000	16.09	7.86	88.7	8.53	16.48	7.66	88.3	8.43
60404	200000	16.02	7.85	88.7	8.54	16.37	7.65	87.8	8.41
60404	210000	15.94	7.84	88.1	8.50	16.28	7.66	87.6	8.40
60404	220000	15.86	7.83	86.9	8.39	16.18	7.66	87.1	8.38
60404	230000	15.82	7.83	87.6	8.47	16.09	7.65	87.1	8.39
60504	0	15.81	7.83	87.1	8.42	16.00	7.65	86.7	8.37
60504	10000	15.78	7.83	87.1	8.43	15.97	7.62	83.5	8.06
60504	20000	15.74	7.83	87.0	8.43	15.92	7.63	84.1	8.13
60504	30000	15.72	7.83	87.5	8.48	15.82	7.65	86.4	8.37
60504	40000	15.68	7.84	88.1	8.55	15.75	7.64	86.1	8.35
60504	50000	15.60	7.84	86.8	8.43	15.69	7.63	84.7	8.23
60504	60000	15.55	7.84	86.6	8.42	15.62	7.62	83.5	8.12

60504	70000	15.48	7.84	86.1	8.39	15.55	7.63	84.9	8.28
60504	80000	15.48	7.84	86.9	8.46	15.56	7.63	83.7	8.16
60504	90000	15.54	7.84	86.7	8.44	15.65	7.64	84.3	8.19
60504	100000	15.65	7.85	86.8	8.42	15.78	7.63	84.5	8.19
60504	110000	15.82	7.84	87.5	8.46	16.00	7.63	84.9	8.19
60504	120000	16.03	7.84	86.4	8.31	16.27	7.65	84.8	8.13
60504	130000	16.21	7.83	86.6	8.30	16.47	7.64	84.5	8.07
60504	140000	16.40	7.82	87.6	8.37	16.68	7.65	85.7	8.15
60504	150000	16.57	7.87	87.6	8.33	16.89	7.65	85.5	8.10
60504	160000	16.60	7.87	86.1	8.19	16.91	7.66	86.8	8.22
60504	170000	16.58	7.85	86.0	8.18	16.85	7.68	87.1	8.26
60504	180000	16.54	7.83	85.9	8.18	16.80	7.67	86.0	8.16
60504	190000	16.49	7.81	86.3	8.23	16.73	7.67	85.3	8.11
60504	200000	16.47	7.81	85.8	8.19	16.67	7.67	85.4	8.13
60504	210000	16.45	7.85	85.1	8.12	16.63	7.66	84.7	8.07
60504	220000	16.43	7.83	85.2	8.13	16.57	7.66	84.4	8.05
60504	230000	16.41	7.89	84.9	8.11	16.51	7.66	83.5	7.97
60604	0	16.42	7.84	85.8	8.19	16.49	7.67	83.9	8.02
60604	10000	16.43	7.82	86.3	8.23	16.48	7.67	83.3	7.96
60604	20000	16.46	7.84	85.2	8.13	16.49	7.67	83.9	8.01
60604	30000	16.48	7.89	85.4	8.14	16.50	7.67	83.5	7.98
60604	40000	16.47	7.84	85.8	8.19	16.50	7.67	83.2	7.94
60604	50000	16.42	7.85	85.9	8.20	16.48	7.67	83.9	8.02
60604	60000	16.34	7.91	85.7	8.20	16.43	7.67	84.1	8.04
60604	70000	16.26	7.85	86.0	8.24	16.38	7.69	84.3	8.07
60604	80000	16.20	7.91	85.1	8.16	16.34	7.68	84.2	8.07
60604	90000	16.21	7.86	84.0	8.05	16.40	7.67	83.9	8.03
60604	100000	16.31	7.90	85.4	8.17	16.57	7.67	83.6	7.97
60604	110000	16.53	7.92	85.3	8.12	16.84	7.68	83.7	7.94
60604	120000	16.75	7.91	86.7	8.22	17.12	7.67	83.7	7.89
60604	130000	17.01	7.89	87.0	8.20	17.46	7.69	86.4	8.08
60604	140000	17.18	7.89	86.5	8.13	17.54	7.68	85.0	7.94
60604	150000	17.18	7.88	86.8	8.16	17.59	7.69	85.9	8.02
60604	160000	17.30	7.88	85.3	7.99	17.65	7.69	85.5	7.97
60604	170000	17.65	7.88	86.2	8.02	17.85	7.70	85.7	7.95
60604	180000	17.73	7.89	86.6	8.05	17.98	7.70	86.1	7.97
60604	190000	17.86	7.89	86.1	7.98	18.09	7.71	86.1	7.96
60604	200000	17.80	7.88	86.0	7.98	18.04	7.70	85.7	7.93
60604	210000	17.82	7.88	86.4	8.01	17.99	7.69	84.7	7.84
60604	220000	17.80	7.88	86.0	7.97	17.95	7.69	84.3	7.81
60604	230000	17.83	7.87	84.0	7.79	17.91	7.69	84.4	7.83
60704	0	17.92	7.88	86.0	7.96	17.94	7.69	84.5	7.83
60704	10000	17.94	7.87	85.2	7.88	17.96	7.69	84.7	7.85
60704	20000	17.93	7.87	85.8	7.94	17.96	7.69	83.7	7.76
60704	30000	17.89	7.88	84.7	7.84	17.93	7.68	84.0	7.79
60704	40000	17.85	7.88	85.8	7.95	17.88	7.68	83.2	7.72
60704	50000	17.79	7.88	84.9	7.88	17.83	7.68	82.9	7.70
60704	60000	17.71	7.88	86.0	8.00	17.77	7.68	82.7	7.70
60704	70000	17.63	7.87	84.6	7.88	17.72	7.68	82.0	7.64
60704	80000	17.61	7.87	84.8	7.90	17.74	7.69	83.2	7.74
60704	90000	17.62	7.87	84.5	7.87	17.80	7.68	81.9	7.61
60704	100000	17.70	7.87	84.7	7.87	17.93	7.68	81.4	7.54
60704	110000	17.86	7.57	90.3	8.32	18.11	7.68	82.7	7.64
60704	120000	18.08	7.58	92.1	8.45	18.35	7.38	88.6	8.09
60704	130000	18.32	7.59	92.1	8.41	18.63	7.34	90.4	8.21
60704	140000	18.55	7.59	92.3	8.38	18.95	7.33	91.8	8.28

60704	150000	18.84	7.60	93.2	8.42	19.18	7.44	92.6	8.32
60704	160000	19.00	7.60	94.4	8.49	19.37	7.32	92.8	8.30
60704	170000	19.15	7.60	93.3	8.37	19.54	7.28	93.6	8.35
60704	180000	19.23	7.60	92.8	8.31	19.59	7.38	93.6	8.34
60704	190000	19.26	7.60	92.7	8.30	19.59	7.44	92.9	8.27
60704	200000	19.20	7.59	92.7	8.31	19.52	7.70	92	8.21
60704	210000	19.19	7.58	91.5	8.21	19.45	7.63	91	8.13
60704	220000	19.23	7.57	91.0	8.16	19.40	7.53	89.9	8.04
60704	230000	19.24	7.57	90.4	8.10	19.39	7.47	88.8	7.94
60804	0	19.26	7.57	89.0	7.97	19.34	7.41	88.2	7.90
60804	10000	19.33	7.57	89.7	8.02	19.36	7.41	87.8	7.86
60804	20000	19.42	7.58	90.0	8.03	19.40	7.42	87.6	7.84
60804	30000	19.49	7.59	90.1	8.03	19.44	7.51	86.8	7.76
60804	40000	19.56	7.60	90.6	8.07	19.49	7.52	86.8	7.75
60804	50000	19.65	7.61	90.4	8.03	19.53	7.49	86.6	7.72
60804	60000	19.74	7.62	91.3	8.10	19.61	7.53	86.8	7.73
60804	70000	19.84	7.63	91.3	8.08	19.73	7.53	86.7	7.70
60804	80000	19.92	7.64	91.5	8.08	19.84	7.65	87.2	7.73
60804	90000	20.02	7.65	91.6	8.08	20.05	7.62	87.1	7.69
60804	100000	20.14	7.66	91.9	8.08	20.31	7.52	88.2	7.75
60804	110000	20.30	7.67	91.9	8.06	20.55	7.56	89.8	7.85
60804	120000	20.38	7.67	93.1	8.16	20.76	7.48	91	7.92
60804	130000	20.63	7.69	92.5	8.06	21.04	7.47	91.7	7.94
60804	140000	20.80	7.68	93.2	8.09	21.31	7.38	92.9	8.00
60804	150000	20.96	7.69	94.0	8.14	21.49	7.40	93	7.98
60804	160000	21.12	7.69	93.2	8.05	21.62	7.42	94.3	8.07
60804	170000	21.20	7.69	94.5	8.14	21.74	7.53	94.4	8.06
60804	180000	21.25	7.68	94.3	8.12	21.82	7.59	93.7	7.99
60804	190000	21.34	7.68	94.3	8.11	21.78	7.58	93.7	7.99
60804	200000	21.31	7.67	94.0	8.09	21.66	7.62	92.3	7.89
60804	210000	21.30	7.66	93.3	8.02	21.59	7.66	91.3	7.82
60804	220000	21.30	7.66	90.9	7.82	21.48	7.67	89.9	7.72
60804	230000	21.28	7.65	89.7	7.71	21.38	7.67	89	7.66
60904	0	21.26	7.64	89.3	7.68	21.27	7.58	88.1	7.60
60904	10000	21.23	7.64	87.6	7.54	21.21	7.56	87	7.51
60904	20000	21.23	7.63	87.9	7.57	21.17	7.50	86.7	7.48
60904	30000	21.24	7.63	86.5	7.45	21.15	7.63	86.1	7.44
60904	40000	21.27	7.63	87.8	7.55	21.15	7.74	85.6	7.39
60904	50000	21.27	7.63	86.6	7.46	21.09	7.75	85.1	7.36
60904	60000	21.25	7.64	85.5	7.36	21.05	7.50	84.7	7.33
60904	70000	21.24	7.64	85.6	7.37	21.02	7.46	84.2	7.30
60904	80000	21.20	7.65	87.6	7.55	21.02	7.47	84.7	7.34
60904	90000	21.13	7.65	87.2	7.53	20.99	7.46	84.5	7.32
60904	100000	21.07	7.66	86.7	7.49	21.00	7.56	84.1	7.29
60904	110000	20.99	7.66	86.7	7.50	20.93	7.61	84.8	7.35
60904	120000	20.89	7.66	86.9	7.53	20.86	7.50	84.8	7.37
60904	130000	20.77	7.66	86.6	7.53	20.79	7.54	85.7	7.45
60904	140000	20.66	7.67	86.1	7.50	20.69	7.51	85.2	7.42
60904	150000	20.52	7.66	88.8	7.76	20.57	7.46	84.9	7.42
60904	160000	20.37	7.66	86.8	7.60	20.43	7.56	84.7	7.42
60904	170000	20.25	7.66	87.0	7.64	20.27	7.68	84.2	7.40
60904	180000	20.11	7.65	86.7	7.63	20.10	8.63	83.5	7.37
60904	190000	20.00	7.65	85.5	7.55	19.99	7.76	83.2	7.35
60904	200000	19.90	7.65	86.1	7.61	19.85	7.73	82.4	7.30
60904	210000	19.79	7.65	86.0	7.62	19.70	7.68	81.7	7.27
60904	220000	19.69	7.65	84.8	7.53	19.61	7.58	81.1	7.22

60904	230000	19.57	7.65	84.8	7.55	19.48	7.53	81.1	7.24
61004	0	19.46	7.64	85.5	7.63	19.35	7.50	80.8	7.24
61004	10000	19.33	7.64	84.7	7.57	19.22	7.51	80.2	7.20
61004	20000	19.25	7.64	83.4	7.47	19.10	7.52	80	7.20
61004	30000	19.14	7.64	84.1	7.55	18.98	7.55	79.6	7.18
61004	40000	19.04	7.64	83.5	7.51	18.86	7.52	79.8	7.21
61004	50000	18.96	7.64	84.7	7.63	18.77	7.52	79.3	7.19
61004	60000	18.89	7.64	83.5	7.54	18.69	7.58	79.6	7.23
61004	70000	18.84	7.65	83.5	7.54	18.61	7.59	79.2	7.19
61004	80000	18.85	7.66	84.6	7.64	18.63	7.57	80.2	7.29
61004	90000	18.87	7.67	85.1	7.68	18.68	7.56	80.3	7.29
61004	100000	18.91	7.69	86.0	7.75	18.77	7.60	81.6	7.39
61004	110000	18.99	7.70	86.3	7.77	18.87	7.65	82.9	7.49
61004	120000	19.17	7.71	88.4	7.93	19.11	7.69	84.1	7.56
61004	130000	19.37	7.72	88.6	7.92	19.38	7.60	85	7.61
61004	140000	19.58	7.73	89.1	7.93	19.69	7.51	86.8	7.72
61004	150000	19.73	7.74	89.5	7.94	19.88	7.40	87.5	7.75
61004	160000	19.77	7.75	89.6	7.94	19.92	7.47	87.6	7.76
61004	170000	19.77	7.75	90.8	8.05	19.90	7.41	88.4	7.83
61004	180000	19.73	7.75	89.8	7.97	19.87	7.45	88.4	7.83
61004	190000	19.71	7.75	90.3	8.01	19.79	7.48	88.4	7.84
61004	200000	19.60	7.74	89.6	7.97	19.66	7.45	87.5	7.78
61004	210000	19.47	7.73	89.6	7.99	19.50	7.38	86.7	7.73
61004	220000	19.31	7.72	88.3	7.90	19.32	7.26	85.7	7.67
61004	230000	19.19	7.71	88.1	7.90	19.18	7.29	85.2	7.65
61104	0	19.07	7.71	86.7	7.80	19.04	7.44	84.4	7.60
61104	10000	18.99	7.70	87.6	7.89	18.92	7.62	84.1	7.59
61104	20000	18.97	7.70	88.1	7.94	18.84	7.78	83.6	7.56
61104	30000	18.97	7.70	88.4	7.96	18.78	7.71	83.9	7.60
61104	40000	18.95	7.70	87.2	7.85	18.74	7.84	83.6	7.57
61104	50000	18.93	7.70	87.8	7.92	18.68	7.74	83.5	7.58
61104	60000	18.91	7.71	88.3	7.96	18.65	7.71	83.4	7.57
61104	70000	18.84	7.72	88.9	8.03	18.60	7.68	83.2	7.57
61104	80000	18.75	7.72	88.7	8.03	18.52	7.71	83.5	7.60
61104	90000	18.66	7.72	89.2	8.09	18.46	7.64	83.8	7.63
61104	100000	18.56	7.72	89.1	8.10	18.40	7.75	83.7	7.64
61104	110000	18.45	7.73	89.2	8.12	18.32	7.69	84.1	7.69
61104	120000	18.31	7.73	88.5	8.08	lure - No data Collected			
61104	130000	18.23	7.73	89.0	8.13				
61104	140000	18.15	7.73	89.1	8.16				
61104	150000	18.11	7.73	89.6	8.22				
61104	160000	18.08	7.73	89.1	8.18				
61104	170000	18.01	7.73	89.3	8.20				
61104	180000	17.92	7.73	88.4	8.14				
61104	190000	17.85	7.71	88.5	8.16				
61104	200000	17.81	7.70	87.6	8.08				
61104	210000	17.73	7.69	87.3	8.07				
61104	220000	17.64	7.69	86.2	7.98				
61104	230000	17.55	7.68	86.3	8.01				
61204	0	17.47	7.68	86.1	7.99				
61204	10000	17.40	7.68	86.2	8.02				
61204	20000	17.35	7.68	85.7	7.98				
61204	30000	17.33	7.69	86.3	8.04				
61204	40000	17.31	7.70	85.7	7.99				
61204	50000	17.30	7.71	87.8	8.18				
61204	60000	17.30	7.71	87.2	8.13				

61204	70000	17.33	7.72	87.7	8.17
61204	80000	17.39	7.72	88.1	8.20
61204	90000	17.46	7.73	88.0	8.18
61204	100000	17.54	7.74	88.4	8.20
61204	110000	17.61	7.74	89.1	8.25
61204	120000	17.71	7.75	89.1	8.24
61204	130000	17.83	7.75	89.8	8.28
61204	140000	18.12	7.75	90.2	8.27
61204	150000	18.43	7.76	91.6	8.35
61204	160000	18.60	7.77	89.8	8.15
61204	170000	18.76	7.78	91.4	8.27
61204	180000	18.89	7.78	92.6	8.36
61204	190000	18.94	7.78	92.5	8.34
61204	200000	18.93	7.78	92.5	8.34
61204	210000	18.89	7.77	91.5	8.26
61204	220000	18.83	7.76	91.2	8.24
61204	230000	18.77	7.75	90.5	8.19
61304	0	18.69	7.74	90.3	8.18
61304	10000	18.61	7.73	89.7	8.14
61304	20000	18.54	7.73	89.2	8.11
61304	30000	18.49	7.73	89.1	8.11
61304	40000	18.46	7.72	88.7	8.08
61304	50000	18.44	7.72	89.1	8.11
61304	60000	18.44	7.72	88.0	8.01
61304	70000	18.46	7.72	88.0	8.01
61304	80000	18.51	7.71	88.2	8.02
61304	90000	18.58	7.71	88.5	8.04
61304	100000	18.70	7.72	87.6	7.94
61304	110000	18.76	7.71	88.6	8.02
61304	120000	18.79	7.73	89.2	8.06
61304	130000	18.81	7.73	89.5	8.09
61304	140000	18.83	7.75	90.5	8.18
61304	150000	18.92	7.75	89.0	8.03
61304	160000	19.11	7.76	89.5	8.04
61304	170000	19.25	7.76	89.8	8.04
61304	180000	19.34	7.77	90.7	8.11
61304	190000	19.24	7.78	90.6	8.11
61304	200000	19.10	7.78	90.6	8.14
61304	210000	18.97	7.78	91.3	8.23
61304	220000	18.85	7.78	90.4	8.16
61304	230000	18.67	7.76	89.6	8.12
61404	0	18.60	7.76	89.1	8.09
61404	10000	18.51	7.74	87.6	7.96
61404	20000	18.44	7.74	87.8	7.99
61404	30000	18.36	7.74	88.1	8.04
61404	40000	18.28	7.73	88.0	8.04
61404	50000	18.19	7.73	87.2	7.98
61404	60000	18.12	7.73	86.9	7.96
61404	70000	18.08	7.73	87.2	8.00
61404	80000	18.15	7.74	87.9	8.05
61404	90000	18.31	7.75	88.4	8.07
61404	100000	18.47	7.75	90.2	8.21
61404	110000	18.50	7.76	88.5	8.05
61404	120000	18.46	7.76	89.5	8.15
61404	130000	18.52	7.77	90.2	8.19
61404	140000	18.72	7.78	90.8	8.22

61404	150000	19.02	7.79	91.6	8.24				
61404	160000	19.21	7.80	92.0	8.25				
61404	170000	19.14	7.81	91.3	8.20				
61404	180000	19.17	7.81	92.5	8.30				
61404	190000	19.17	7.81	91.2	8.18				
61404	200000	19.11	7.80	90.4	8.12				
61404	210000	19.00	7.80	91.1	8.20				
61404	220000	18.97	7.80	89.9	8.10				
61404	230000	19.00	7.79	90.6	8.16				
61504	0	18.92	7.79	89.7	8.09				
61504	10000	18.84	7.78	89.7	8.10				
61504	20000	18.80	7.78	89.6	8.10				
61504	30000	18.77	7.78	90.4	8.18				
61504	40000	18.76	7.78	88.9	8.04				
61504	50000	18.76	7.78	89.1	8.06				
61504	60000	18.74	7.78	89.4	8.09				
61504	70000	18.71	7.78	89.6	8.11				
61504	80000	18.69	7.78	88.2	7.99				
61504	90000	18.76	7.79	89.1	8.06				
61504	100000	18.87	7.80	89.1	8.04				
61504	110000	19.04	7.81	91.3	8.22				
61504	120000	19.14	7.81	90.8	8.16				
61504	130000	19.17	7.82	92.0	8.25				
61504	140000	19.27	7.82	91.5	8.19				
61504	150000	19.52	7.82	91.9	8.19				
61504	160000	19.60	7.82	92.2	8.20				
61504	170000	19.74	7.83	92.8	8.23				
61504	180000	19.88	7.83	92.4	8.17				
61504	190000	19.83	7.83	93.3	8.26				
61504	200000	19.73	7.83	93.2	8.26				
61504	210000	19.64	7.82	93.2	8.28				
61504	220000	19.55	7.81	91.5	8.14				
61504	230000	19.53	7.80	91.6	8.16				
61604	0	19.48	7.79	91.8	8.18				
61604	10000	19.41	7.79	91.9	8.21				
61604	20000	19.35	7.79	90.9	8.12				
61604	30000	19.30	7.78	91.3	8.17				
61604	40000	19.23	7.79	90.8	8.14				
61604	50000	19.16	7.79	90.7	8.14				
61604	60000	19.11	7.79	90.6	8.14				
61604	70000	19.07	7.80	91.3	8.21				
61604	80000	19.10	7.80	91.8	8.25				
61604	90000	19.18	7.81	91.2	8.18				
61604	100000	19.28	7.82	92.7	8.30	19.37	7.56	88.3	7.95
61604	110000	20.81	7.60	111.1	9.65	19.60	7.59	88.0	7.89
61604	120000	19.63	7.67	90.5	8.11	19.83	7.59	88.1	7.86
61604	130000	19.84	7.68	91.8	8.19	20.11	7.61	88.9	7.89
61604	140000	20.11	7.69	92.9	8.24	20.43	7.63	89.3	7.87
61604	150000	20.15	7.69	92.8	8.23	20.53	7.63	89.7	7.89
61604	160000	20.20	7.69	91.0	8.07	20.57	7.63	89.1	7.83
61604	170000	20.25	7.69	91.2	8.07	20.67	7.63	89.9	7.89
61604	180000	20.32	7.68	91.5	8.09	20.74	7.62	89.4	7.83
61604	190000	20.37	7.68	90.8	8.02	20.73	7.63	89.2	7.82
61604	200000	20.36	7.67	90.0	7.95	20.69	7.62	88.5	7.76
61604	210000	20.32	7.66	89.6	7.92	20.64	7.62	88.0	7.72
61604	220000	20.27	7.65	88.8	7.85	20.50	7.59	86.9	7.65

61604	230000	20.21	7.64	88.9	7.88	20.40	7.58	85.9	7.57
61704	0	20.11	7.64	87.1	7.73	20.29	7.58	85.2	7.53
61704	10000	20.04	7.64	87.9	7.82	20.16	7.56	84.1	7.45
61704	20000	19.99	7.64	88.2	7.85	20.07	7.56	83.8	7.44
61704	30000	19.97	7.64	87.3	7.77	20.02	7.56	83.1	7.38
61704	40000	19.97	7.64	87.6	7.80	19.98	7.55	82.7	7.36
61704	50000	19.98	7.65	86.8	7.72	19.96	7.55	82.7	7.35
61704	60000	20.01	7.65	87.0	7.74	19.95	7.55	82.3	7.33
61704	70000	20.05	7.66	87.4	7.77	19.96	7.55	82.2	7.31
61704	80000	20.10	7.67	87.9	7.80	20.01	7.56	82.3	7.31
61704	90000	20.14	7.67	87.7	7.78	20.05	7.56	82.2	7.30
61704	100000	20.20	7.68	89.7	7.95	20.14	7.57	81.8	7.25
61704	110000	20.28	7.69	88.8	7.85	20.28	7.57	82.3	7.28
61704	120000	20.30	7.70	87.2	7.71	20.38	7.59	83.1	7.33
61704	130000	20.42	7.71	88.7	7.82	20.60	7.60	84.2	7.40
61704	140000	20.53	7.71	89.3	7.86	20.87	7.62	84.9	7.42
61704	150000	20.63	7.72	88.9	7.81	21.08	7.63	85.7	7.46
61704	160000	20.77	7.72	90.3	7.91	21.21	7.62	84.9	7.37
61704	170000	20.78	7.72	89.9	7.87	21.27	7.64	85.8	7.44
61704	180000	20.80	7.72	89.6	7.84	21.29	7.65	86.3	7.48
61704	190000	20.82	7.72	89.2	7.81	21.23	7.65	86.5	7.50
61704	200000	20.81	7.71	89.5	7.83	21.12	7.63	85.8	7.46
61704	210000	20.76	7.70	88.8	7.78	20.97	7.63	85.3	7.44
61704	220000	20.64	7.69	87.2	7.66	20.84	7.62	84.5	7.38
61704	230000	20.55	7.68	88.6	7.79	20.69	7.60	83.5	7.32
61804	0	20.45	7.68	86.6	7.63	20.56	7.59	83.0	7.30
61804	10000	20.39	7.67	86.7	7.65	20.45	7.58	82.7	7.28
61804	20000	20.34	7.67	87.1	7.69	20.36	7.58	81.7	7.21
61804	30000	20.30	7.67	86.8	7.68	20.30	7.57	80.8	7.14
61804	40000	20.28	7.67	85.2	7.54	20.23	7.58	81.0	7.17
61804	50000	20.27	7.67	86.3	7.63	20.20	7.57	80.9	7.17
61804	60000	20.27	7.68	88.1	7.80	20.16	7.57	80.6	7.14
61804	70000	20.29	7.68	87.7	7.76	20.16	7.57	81.5	7.23
61804	80000	20.36	7.69	88.1	7.78	20.25	7.58	81.9	7.25
61804	90000	20.48	7.70	88.6	7.81	20.39	7.57	81.4	7.18
61804	100000	20.64	7.71	89.3	7.84	20.61	7.59	81.9	7.19
61804	110000	20.84	7.73	89.6	7.83	20.87	7.60	82.4	7.20
61804	120000	21.03	7.74	88.4	7.70	21.15	7.63	85.2	7.41
61804	130000	21.18	7.75	91.0	7.91	21.41	7.64	85.3	7.38
61804	140000	21.35	7.75	90.0	7.80	21.59	7.67	86.8	7.48
61804	150000	21.34	7.75	90.7	7.86	21.60	7.67	86.9	7.48
61804	160000	21.26	7.75	89.4	7.75	21.55	7.67	87.3	7.53
61804	170000	21.28	7.74	89.2	7.74	21.61	7.68	87.0	7.50
61804	180000	21.34	7.74	89.8	7.78	21.58	7.68	86.7	7.47
61804	190000	21.22	7.73	88.5	7.68	21.46	7.68	86.4	7.46
61804	200000	20.99	7.73	87.9	7.67	21.26	7.67	85.9	7.45
61804	210000	20.78	7.72	87.4	7.66	20.94	7.65	84.4	7.37
61804	220000	20.54	7.70	86.2	7.59	20.68	7.64	83.5	7.32
61804	230000	20.36	7.69	85.2	7.52	20.44	7.63	82.9	7.31
61904	0	20.18	7.68	86.3	7.65	20.23	7.61	82.0	7.26
61904	10000	20.07	7.67	84.0	7.46	20.04	7.60	81.3	7.22
61904	20000	19.98	7.67	84.4	7.51	19.91	7.60	80.8	7.20
61904	30000	19.87	7.67	85.1	7.59	19.76	7.59	80.9	7.23
61904	40000	19.73	7.68	84.5	7.55	19.62	7.59	80.3	7.19
61904	50000	19.60	7.68	84.5	7.58	19.49	7.58	80.3	7.21
61904	60000	19.50	7.68	84.8	7.61	19.37	7.59	80.4	7.24

61904	70000	19.44	7.68	84.5	7.60	19.30	7.59	80.5	7.25
61904	80000	19.40	7.69	85.9	7.73	19.29	7.59	80.7	7.27
61904	90000	19.39	7.70	85.6	7.70	19.34	7.60	81.0	7.29
61904	100000	19.47	7.70	86.3	7.76	19.49	7.62	81.6	7.32
61904	110000	19.60	7.71	86.5	7.75	19.68	7.62	82.6	7.39
61904	120000	19.77	7.71	87.1	7.78	19.90	7.62	82.3	7.33
61904	130000	19.96	7.72	87.5	7.79	20.13	7.64	84.2	7.47
61904	140000	20.12	7.73	88.8	7.88	20.31	7.64	84.6	7.47
61904	150000	20.31	7.73	90.0	7.95	20.54	7.65	85.3	7.51
61904	160000	20.47	7.74	88.1	7.77	20.64	7.65	85.4	7.49
61904	170000	20.47	7.74	89.3	7.87	20.69	7.66	85.8	7.53
61904	180000	20.54	7.73	89.5	7.87	20.81	7.66	85.4	7.47
61904	190000	20.59	7.74	89.5	7.87	20.76	7.66	85.5	7.49
61904	200000	20.53	7.73	89.9	7.91	20.64	7.64	84.9	7.45
61904	210000	20.31	7.72	89.2	7.88	20.47	7.63	84.1	7.41
61904	220000	20.16	7.70	86.7	7.69	20.36	7.62	82.9	7.32
61904	230000	20.11	7.70	86.9	7.71	20.18	7.61	81.7	7.24
62004	0	19.98	7.68	85.3	7.59	20.00	7.60	80.3	7.14
62004	10000	19.80	7.68	84.8	7.57	19.79	7.59	79.5	7.09
62004	20000	19.58	7.67	83.8	7.52	19.60	7.58	78.2	7.01
62004	30000	19.40	7.66	82.6	7.44	19.45	7.58	77.3	6.95
62004	40000	19.30	7.65	81.4	7.34	19.30	7.56	76.3	6.87
62004	50000	19.22	7.65	82.4	7.44	19.19	7.57	76.8	6.94
62004	60000	19.15	7.66	81.5	7.37	19.09	7.57	76.9	6.96
62004	70000	19.10	7.67	81.7	7.40	19.03	7.58	77.0	6.97
62004	80000	19.09	7.67	82.6	7.49	19.06	7.59	77.3	7.01
62004	90000	19.21	7.70	83.6	7.55	19.19	7.61	78.3	7.07
62004	100000	19.40	7.72	86.1	7.75	19.38	7.62	79.0	7.11
62004	110000	19.62	7.74	87.0	7.80	19.62	7.63	80.0	7.16
62004	120000	19.89	7.77	88.6	7.90	19.87	7.66	81.5	7.26
62004	130000	20.04	7.79	89.9	7.99	20.10	7.68	83.6	7.42
62004	140000	20.25	7.80	90.3	8.00	20.29	7.69	82.4	7.28
62004	150000	20.36	7.82	91.4	8.08	20.45	7.72	84.6	7.45
62004	160000	20.40	7.83	91.4	8.06	20.53	7.73	84.6	7.44
62004	170000	20.41	7.83	91.8	8.10	20.58	7.75	85.5	7.51
62004	180000	20.38	7.84	91.8	8.10	20.58	7.76	86.2	7.57
62004	190000	20.33	7.83	90.9	8.03	20.50	7.76	86.0	7.57
62004	200000	20.20	7.82	90.7	8.04	20.35	7.75	85.0	7.50
62004	210000	20.06	7.81	90.4	8.03	20.18	7.73	84.0	7.44
62004	220000	19.93	7.79	88.5	7.89	20.05	7.71	82.7	7.35
62004	230000	19.81	7.78	87.9	7.85	19.91	7.69	82.1	7.31
62104	0	19.72	7.77	88.2	7.89	19.76	7.68	81.3	7.26
62104	10000	19.66	7.76	87.3	7.82	19.67	7.68	80.7	7.22
62104	20000	19.61	7.75	86.4	7.75	19.59	7.67	79.7	7.14
62104	30000	19.57	7.74	85.3	7.66	19.53	7.67	79.8	7.16
62104	40000	19.54	7.74	86.1	7.73	19.47	7.65	78.8	7.08
62104	50000	19.48	7.74	85.9	7.72	19.43	7.65	78.4	7.05
62104	60000	19.41	7.73	84.5	7.60	19.38	7.65	78.1	7.03
62104	70000	19.41	7.74	84.7	7.63	19.35	7.64	77.9	7.02
62104	80000	19.44	7.75	84.5	7.60	19.39	7.64	77.9	7.01
62104	90000	19.53	7.76	86.3	7.75	19.53	7.66	78.4	7.03
62104	100000	19.70	7.77	86.6	7.75	19.72	7.65	77.5	6.92
62104	110000	19.89	7.79	87.5	7.80	19.90	7.66	77.8	6.93
62104	120000	20.04	7.80	87.2	7.75	20.07	7.68	79.3	7.04
62104	130000	20.15	7.82	89.0	7.89	20.20	7.69	80.5	7.13
62104	140000	20.23	7.83	90.0	7.97	20.29	7.72	80.7	7.13

62104	150000	20.27	7.84	90.3	7.99	20.36	7.74	82.1	7.25
62104	160000	20.34	7.85	89.1	7.87	20.46	7.76	83.2	7.33
62104	170000	20.41	7.86	91.2	8.05	20.54	7.75	82.1	7.22
62104	180000	20.48	7.87	90.2	7.95	20.67	7.77	84.0	7.37
62104	190000	20.44	7.87	91.5	8.06	20.63	7.77	83.6	7.34
62104	200000	20.29	7.86	90.9	8.04	20.44	7.78	83.5	7.36
62104	210000	20.13	7.85	89.2	7.91	20.28	7.75	81.7	7.22
62104	220000	20.01	7.84	87.1	7.75	20.12	7.75	81.1	7.19
62104	230000	19.89	7.82	87.0	7.76	20.00	7.73	79.8	7.09
62204	0	19.82	7.81	84.8	7.57	19.88	7.71	78.7	7.01
62204	10000	19.73	7.80	85.2	7.62	19.78	7.71	78.2	6.98
62204	20000	19.65	7.79	83.7	7.50	19.65	7.69	77.5	6.94
62204	30000	19.51	7.77	83.4	7.49	19.52	7.69	76.7	6.89
62204	40000	19.39	7.77	82.5	7.43	19.38	7.68	76.4	6.88
62204	50000	19.26	7.76	81.0	7.31	19.24	7.68	76.2	6.87
62204	60000	19.14	7.75	81.7	7.39	19.11	7.67	75.5	6.83
62204	70000	19.04	7.75	83.1	7.53	19.02	7.66	74.8	6.78
62204	80000	19.04	7.75	82.9	7.51	19.00	7.67	75.4	6.84
62204	90000	19.08	7.76	84.3	7.64	19.08	7.68	76.0	6.88
62204	100000	19.21	7.78	85.1	7.69	19.27	7.70	76.5	6.90
62204	110000	19.39	7.80	68.8	6.19	19.46	7.70	76.9	6.91
62204	120000	19.52	7.81	78.5	7.05	19.63	7.72	77.8	6.97
62204	130000	19.73	7.83	83.4	7.46	19.83	7.73	78.1	6.97
62204	140000	19.97	7.87	90.6	8.06	19.99	7.77	80.2	7.13
62204	150000	20.03	7.88	90.6	8.05	20.10	7.78	82.2	7.29
62204	160000	20.07	7.88	90.6	8.05	20.16	7.79	82.5	7.31
62204	170000	20.15	7.88	91.7	8.13	20.28	7.78	81.5	7.21
62204	180000	20.17	7.88	90.0	7.98	20.32	7.80	82.2	7.26
62204	190000	20.12	7.87	90.5	8.03	20.25	7.80	82.7	7.31
62204	200000	20.05	7.86	87.1	7.74	20.16	7.79	80.8	7.16
62204	210000	19.92	7.84	88.9	7.92	20.02	7.77	79.9	7.10
62204	220000	19.85	7.83	88.8	7.92	19.93	7.76	79.3	7.06
62204	230000	19.83	7.82	88.4	7.89	19.84	7.74	78.4	6.99
62304	0	19.77	7.81	84.5	7.55	19.78	7.74	77.9	6.95
62304	10000	19.70	7.81	86.1	7.71	19.68	7.72	77.6	6.94
62304	20000	19.63	7.80	85.1	7.63	19.57	7.70	76.4	6.85
62304	30000	19.56	7.79	86.4	7.75	19.46	7.67	74.1	6.66
62304	40000	19.48	7.79	83.1	7.47	19.36	7.70	76.7	6.90
62304	50000	19.36	7.79	83.6	7.53	19.25	7.69	76.2	6.87
62304	60000	19.27	7.78	84.8	7.66	19.17	7.68	75.6	6.84
62304	70000	19.24	7.78	81.2	7.33	19.13	7.67	75.0	6.78
62304	80000	19.25	7.78	81.2	7.33	19.13	7.68	75.8	6.86
62304	90000	19.33	7.79	83.9	7.56	19.22	7.68	75.4	6.81
62304	100000	19.44	7.81	83.4	7.50	19.37	7.69	76.0	6.85
62304	110000	19.59	7.83	82.0	7.35	19.62	7.71	77.0	6.90
62304	120000	19.76	7.84	76.1	6.80	19.88	7.70	75.2	6.70
62304	130000	19.98	7.86	81.2	7.22	20.10	7.76	78.8	6.99
62304	140000	20.18	7.90	85.8	7.61	20.25	7.80	82.3	7.28
62304	150000	20.33	7.94	94.9	8.39	20.42	7.78	79.4	7.00
62304	160000	20.42	7.96	92.4	8.15	20.49	7.82	80.7	7.10
62304	170000	20.49	7.99	93.1	8.20	20.62	7.87	83.2	7.30
62304	180000	20.51	8.00	92.7	8.16	20.70	7.85	84.6	7.42
62304	190000	20.50	7.99	93.7	8.25	20.67	7.86	83.7	7.34
62304	200000	20.40	7.99	93.0	8.21	20.56	7.86	82.4	7.24
62304	210000	20.26	7.98	92.9	8.22	20.40	7.89	84.8	7.48
62304	220000	20.14	7.95	87.4	7.75	20.22	7.86	82.6	7.31

62304	230000	20.00	7.93	86.8	7.72	20.06	7.84	80.8	7.18
62404	0	19.83	7.92	88.2	7.87	19.88	7.82	80.0	7.13
62404	10000	19.66	7.90	87.7	7.86	19.69	7.80	78.8	7.05
62404	20000	19.47	7.87	84.0	7.55	19.45	7.78	77.4	6.96
62404	30000	19.28	7.85	83.9	7.57	19.29	7.78	76.8	6.93
62404	40000	19.13	7.84	82.5	7.46	19.09	7.77	75.7	6.85
62404	50000	19.03	7.83	82.9	7.52	18.91	7.75	75.3	6.84
62404	60000	18.91	7.83	82.1	7.47	18.79	7.75	74.5	6.78
62404	70000	18.84	7.83	80.7	7.35	18.70	7.75	74.6	6.81
62404	80000	18.81	7.83	63.5	5.79	18.63	7.76	74.5	6.80
62404	90000	18.77	7.83	77.2	7.04	18.60	7.76	74.2	6.79
62404	100000	18.82	7.84	78.9	7.18	18.63	7.77	75.4	6.89
62404	110000	18.93	7.86	77.8	7.07	18.83	7.79	76.9	7.00
62404	120000	19.08	7.89	81.4	7.37	18.90	7.88	88.1	8.02
62404	140000	19.39	7.84	88.5	7.99	19.09	7.90	91.9	8.33
62404	150000	19.52	7.88	90.2	8.11	19.32	7.94	94.2	8.50
62404	160000	19.67	7.93	92.0	8.25	19.48	7.98	95.6	8.61
62404	170000	19.79	7.96	93.2	8.34	19.57	8.00	96.7	8.68
62404	180000	19.82	7.97	92.9	8.31	19.67	8.01	96.8	8.68
62404	190000	19.78	7.97	93.6	8.37	19.73	8.03	98.1	8.78
62404	200000	19.70	7.96	93.0	8.34	19.74	8.04	97.9	8.77
62404	210000	19.61	7.94	92.5	8.31	19.66	8.05	97.6	8.76
62404	220000	19.48	7.91	91.6	8.25	19.56	8.02	96.1	8.63
62404	230000	19.33	7.88	91.0	8.22	19.43	8.01	95.2	8.58
62504	0	19.18	7.85	89.9	8.14	19.29	7.99	94.2	8.51
62504	10000	19.00	7.83	87.9	7.99	19.12	7.97	92.5	8.39
62504	20000	18.82	7.81	88.0	8.03	18.91	7.95	91.3	8.31
62504	30000	18.65	7.79	86.8	7.95	18.73	7.93	89.5	8.18
62504	40000	18.48	7.77	86.2	7.92	18.51	7.92	88.2	8.09
62504	50000	18.32	7.76	84.9	7.83	18.31	7.91	87.8	8.09
62504	60000	18.02	7.74	83.3	7.72	18.10	7.90	87.1	8.06
62504	70000	17.90	7.74	83.2	7.73	17.92	7.89	86.1	8.00
62504	80000	17.87	7.75	83.1	7.73	17.78	7.89	86.4	8.05
62504	90000	17.92	7.76	83.4	7.75	17.74	7.90	86.4	8.05
62504	100000	18.04	7.77	79.7	7.39	17.80	7.92	87.3	8.13
62504	110000	18.22	7.79	87.0	8.04	17.94	7.94	88.4	8.21
62504	120000	18.35	7.81	87.8	8.09	18.13	7.97	90.3	8.35
62504	130000	18.50	7.84	87.8	8.07	18.31	8.00	91.3	8.42
62504	140000	18.64	7.87	88.6	8.11	18.50	8.02	92.9	8.53
62504	150000	18.80	7.90	89.9	8.21	18.65	8.06	94.5	8.64
62504	160000	18.91	7.93	91.3	8.31	18.84	8.10	96.5	8.80
62504	170000	19.02	7.95	91.8	8.34	18.91	8.12	97.4	8.87
62504	180000	19.05	7.96	92.5	8.40	18.97	8.13	97.7	8.88
62504	190000	19.05	7.97	92.3	8.38	19.02	8.15	98.0	8.91
62504	200000	19.01	7.96	92.6	8.42	19.01	8.16	98.2	8.92
62504	210000	18.92	7.95	91.8	8.36	18.95	8.15	97.4	8.86
62504	220000	18.86	7.94	91.0	8.30	18.88	8.14	96.7	8.81
62504	230000	18.79	7.92	90.3	8.25	18.80	8.14	95.3	8.69
62604	0	18.64	7.90	89.6	8.21	18.69	8.11	94.8	8.67
62604	10000	18.47	7.87	88.9	8.17	18.56	8.09	93.9	8.61
62604	20000	18.32	7.85	86.7	8.00	18.40	8.07	93.0	8.55
62604	30000	18.16	7.83	85.6	7.92	18.24	8.06	91.9	8.48
62604	40000	18.01	7.81	84.9	7.88	18.06	8.05	90.4	8.37
62604	50000	17.89	7.80	83.9	7.80	17.92	8.03	90.1	8.37
62604	60000	17.84	7.79	76.2	7.09	17.79	8.02	88.9	8.28
62604	70000	17.79	7.78	84.4	7.87	17.70	8.01	88.4	8.25

62604	80000	17.78	7.78	84.9	7.91	17.63	8.01	88.1	8.23
62604	90000	17.84	7.79	85.0	7.92	17.62	8.02	88.7	8.29
62604	100000	17.96	7.82	86.0	7.99	17.75	8.04	89.8	8.37
62604	110000	18.11	7.84	86.1	7.97	17.95	8.07	91.5	8.49
62604	120000	18.32	7.87	87.4	8.06	18.22	8.10	93.0	8.59
62604	130000	18.50	7.89	88.3	8.11	18.38	8.13	94.4	8.69
62604	140000	18.69	7.93	89.4	8.18	18.57	8.16	96.4	8.84
62604	150000	18.96	7.96	91.2	8.30	18.79	8.18	97.4	8.89
62604	160000	19.19	8.00	92.2	8.35	19.01	8.22	99.0	9.00
62604	170000	19.35	8.01	92.9	8.39	19.26	8.25	100.4	9.07
62604	180000	19.45	8.02	94.1	8.48	19.42	8.26	101.3	9.13
62604	190000	19.43	8.03	96.3	8.68	19.49	8.28	101.9	9.17
62604	200000	19.36	8.02	96.2	8.68	19.52	8.29	102.3	9.20
62604	210000	19.27	8.01	94.6	8.56	19.45	8.28	101.4	9.13
62604	220000	19.22	7.98	76.9	6.96	19.37	8.26	100.5	9.06
62604	230000	19.18	7.96	87.8	7.95	19.28	8.24	98.7	8.92
62704	0	19.07	7.93	91.1	8.27	19.14	8.22	97.1	8.80
62704	10000	18.92	7.91	90.0	8.20	18.98	8.19	96.0	8.73
62704	20000	18.75	7.88	88.8	8.12	18.85	8.17	95.2	8.68
62704	30000	18.62	7.86	87.6	8.02	18.69	8.15	93.3	8.53
62704	40000	18.51	7.84	86.4	7.94	18.52	8.12	91.8	8.43
62704	50000	18.37	7.82	86.8	8.00	18.35	8.11	91.0	8.38
62704	60000	18.26	7.80	84.4	7.79	18.21	8.10	89.9	8.30
62704	70000	18.17	7.80	84.8	7.84	18.10	8.09	89.4	8.27
62704	80000	18.13	7.80	84.3	7.80	18.01	8.09	89.1	8.26
62704	90000	18.16	7.81	84.4	7.80	18.01	8.09	89.8	8.33
62704	100000	18.27	7.83	85.6	7.90	18.12	8.12	90.7	8.39
62704	110000	18.46	7.85	86.4	7.95	18.32	8.14	91.9	8.46
62704	120000	18.71	7.89	87.3	7.99	18.62	8.17	93.6	8.57
62704	130000	19.01	7.93	88.9	8.08	18.89	8.20	96.0	8.74
62704	140000	19.18	7.97	89.9	8.15	19.15	8.25	98.3	8.90
62704	150000	19.37	8.01	90.3	8.15	19.25	8.27	98.9	8.94
62704	160000	19.53	8.04	92.7	8.34	19.46	8.29	100.5	9.05
62704	170000	19.60	8.07	94.1	8.45	19.55	8.34	102.2	9.18
62704	180000	19.59	8.08	94.6	8.50	19.55	8.35	102.6	9.22
62704	190000	19.58	8.09	94.4	8.49	19.54	8.36	102.3	9.20
62704	200000	19.58	8.09	94.5	8.49	19.57	8.36	102.6	9.21
62704	210000	19.54	8.07	94.0	8.46	19.58	8.36	102.3	9.19
62704	220000	19.41	8.05	93.7	8.45	19.52	8.35	101.4	9.11
62704	230000	19.31	8.03	92.4	8.35	19.43	8.34	99.1	8.93
62804	0	19.20	8.00	91.0	8.24	19.29	8.31	97.9	8.84
62804	10000	19.04	7.97	90.0	8.18	19.10	8.29	96.7	8.77
62804	20000	18.85	7.94	88.0	8.02	18.94	8.26	95.4	8.68
62804	30000	18.53	7.90	87.5	8.03	18.77	8.24	93.8	8.57
62804	40000	18.41	7.89	87.0	8.01	18.59	8.22	92.7	8.49
62804	50000	18.22	7.86	84.8	7.83	18.35	8.20	90.4	8.33
62804	60000	18.15	7.86	75.7	7.00	18.21	8.19	90.7	8.37
62804	70000	18.06	7.84	84.7	7.85	18.06	8.17	89.8	8.32
62804	80000	18.02	7.84	84.6	7.84	17.95	8.17	89.4	8.30
62804	90000	18.05	7.85	84.6	7.85	17.93	8.17	88.9	8.25
62804	100000	18.18	7.86	85.0	7.86	18.03	8.18	90.2	8.36
62804	110000	18.38	7.88	84.9	7.82	18.23	8.20	91.7	8.46
62804	120000	18.60	7.91	87.0	7.97	18.51	8.22	93.6	8.59
62804	130000	18.90	7.94	87.3	7.95	18.82	8.26	95.4	8.70
62804	140000	19.06	7.97	89.4	8.12	19.02	8.29	97.2	8.83
62804	150000	19.33	8.02	91.0	8.22	19.24	8.32	98.9	8.94

62804	160000	19.60	8.07	92.6	8.32	19.61	8.36	101.6	9.12
62804	170000	19.71	8.09	92.9	8.32	19.72	8.39	101.8	9.12
62804	180000	19.85	8.12	94.1	8.41	19.84	8.41	103.6	9.25
62804	190000	19.97	8.13	94.7	8.44	20.00	8.44	105.3	9.37
62804	200000	19.98	8.14	94.3	8.41	20.01	8.45	104.8	9.33
62804	210000	19.93	8.13	94.5	8.43	20.00	8.46	104.9	9.34
62804	220000	19.80	8.10	94.5	8.46	19.93	8.45	104.5	9.31
62804	230000	19.60	8.05	94.9	8.53	19.87	8.43	102.6	9.16
62904	0	19.54	8.03	93.8	8.43	19.74	8.40	101.5	9.08
62904	10000	19.47	8.01	90.8	8.18	19.60	8.37	99.3	8.92
62904	20000	19.40	7.97	89.7	8.09	19.47	8.34	97.5	8.77
62904	30000	19.30	7.94	88.2	7.97	19.36	8.32	96.5	8.70
62904	40000	19.16	7.91	88.3	8.00	19.27	8.30	95.5	8.63
62904	50000	19.02	7.89	86.5	7.86	19.14	8.28	94.5	8.56
62904	60000	18.90	7.88	86.2	7.86	19.01	8.26	93.4	8.49
62904	70000	18.85	7.88	86.4	7.88	18.88	8.24	92.2	8.40
62904	80000	18.87	7.88	86.5	7.88	18.83	8.24	92.3	8.42
62904	90000	18.97	7.90	87.7	7.98	18.84	8.24	92.0	8.39
62904	100000	19.16	7.92	88.6	8.03	18.95	8.26	93.6	8.51
62904	110000	19.39	7.95	72.4	6.53	19.19	8.28	94.8	8.58
62904	120000	19.63	7.98	86.7	7.79	19.51	8.31	96.9	8.71
62904	130000	19.92	8.01	90.0	8.04	19.90	8.36	97.9	8.73
62904	140000	20.20	8.06	91.5	8.12	20.21	8.40	101.4	9.00
62904	150000	20.35	8.09	93.5	8.28	20.52	8.44	102.5	9.04
62904	160000	20.49	8.12	93.3	8.24	20.71	8.46	104.1	9.14
62904	170000	20.63	8.15	94.2	8.29	20.76	8.48	105.3	9.24
62904	180000	20.71	8.18	94.2	8.28	20.81	8.51	106.0	9.29
62904	190000	20.73	8.19	95.1	8.35	20.85	8.53	107.3	9.39
62904	200000	20.70	8.19	94.7	8.32	20.87	8.55	107.9	9.44
62904	210000	20.70	8.18	93.9	8.25	20.89	8.56	107.8	9.43
62904	220000	20.74	8.19	94.0	8.26	20.86	8.55	106.9	9.36
62904	230000	20.69	8.16	92.9	8.17	20.76	8.53	105.8	9.28
63004	0	20.60	8.13	92.0	8.10	20.66	8.50	103.5	9.10
63004	10000	20.48	8.10	91.5	8.07	20.55	8.48	102.2	9.01
63004	20000	20.34	8.07	89.8	7.95	20.43	8.44	100.4	8.87
63004	30000	20.23	8.03	87.5	7.76	20.30	8.42	98.9	8.75
63004	40000	20.10	8.00	86.9	7.72	20.14	8.39	97.4	8.65
63004	50000	19.93	7.96	87.4	7.80	19.98	8.37	96.2	8.57
63004	60000	19.74	7.94	85.1	7.62	19.79	8.33	94.0	8.41
63004	70000	19.53	7.92	85.9	7.72	19.62	8.31	92.8	8.33
63004	80000	19.46	7.91	84.8	7.64	19.49	8.29	91.8	8.26
63004	90000	19.49	7.92	84.4	7.60	19.43	8.29	91.7	8.26
63004	100000	19.62	7.93	75.8	6.81	19.51	8.30	92.4	8.31
63004	110000	19.82	7.96	85.0	7.61	19.68	8.33	94.0	8.43
63004	120000	20.00	7.97	86.0	7.67	19.95	8.35	95.9	8.55
63004	130000	20.43	8.02	87.8	7.76	20.28	8.39	97.8	8.66
63004	140000	20.73	8.05	87.5	7.69	20.66	8.43	99.4	8.74
63004	150000	21.03	8.12	94.8	8.28	20.95	8.48	101.7	8.89
63004	160000	21.30	8.18	96.6	8.39	21.32	8.53	105.8	9.18
63004	170000	21.47	8.21	98.5	8.53	21.58	8.58	107.2	9.25
63004	180000	21.54	8.22	87.5	7.57	21.74	8.60	108.5	9.34
63004	190000	21.68	8.26	95.3	8.22	21.91	8.62	109.8	9.42
63004	200000	21.71	8.26	96.2	8.29	21.87	8.65	109.5	9.40
63004	210000	21.68	8.25	96.7	8.34	21.91	8.65	109.6	9.40
63004	220000	21.61	8.23	94.0	8.12	21.86	8.65	109.3	9.38
63004	230000	21.55	8.21	93.7	8.10	21.73	8.62	106.6	9.17

70104	0	21.49	8.18	93.9	8.13	21.70	8.60	106.2	9.14
70104	10000	21.40	8.15	91.6	7.94	21.60	8.56	104.4	9.01
70104	20000	21.30	8.12	89.0	7.73	21.45	8.52	101.8	8.81
70104	30000	21.18	8.08	89.2	7.77	21.32	8.50	99.7	8.65
70104	40000	21.01	8.04	88.2	7.70	21.17	8.46	98.7	8.59
70104	50000	20.87	8.01	84.4	7.39	20.99	8.43	96.9	8.46
70104	60000	20.73	7.98	83.8	7.36	20.83	8.40	95.7	8.38
70104	70000	20.61	7.96	82.9	7.30	20.68	8.38	94.4	8.30
70104	80000	20.55	7.95	83.8	7.38	20.55	8.36	93.6	8.24
70104	90000	20.49	7.96	82.6	7.29	20.50	8.35	93.2	8.22
70104	100000	20.59	7.97	83.5	7.35	20.52	8.36	93.6	8.25
70104	110000	20.74	8.00	87.3	7.66	20.70	8.40	94.2	8.27
70104	120000	20.86	8.00	86.5	7.58	20.97	8.43	96.7	8.45
70104	130000	21.36	8.11	93.4	8.11	21.27	8.48	99.1	8.61
70104	140000	21.65	8.17	96.6	8.33	21.64	8.54	102.5	8.84
70104	150000	21.79	8.20	95.2	8.19	21.86	8.58	105.2	9.03
70104	160000	22.10	8.26	80.6	6.89	22.19	8.64	109.7	9.38
70104	170000	22.27	8.30	92.2	7.86	22.40	8.68	111.9	9.51
70104	180000	22.43	8.32	95.7	8.14	22.61	8.72	112.6	9.53
70104	190000	22.50	8.34	97.3	8.26	22.72	8.75	115.9	9.79
70104	200000	22.54	8.35	97.8	8.30	22.77	8.77	114.8	9.69
70104	210000	22.55	8.35	100.3	8.50	22.73	8.76	115.3	9.74
70104	220000	22.46	8.33	98.6	8.38	22.61	8.77	114.3	9.68
70104	230000	22.36	8.30	98.5	8.38	22.50	8.74	110.4	9.36
70204	0	22.21	8.26	98.1	8.38	22.36	8.70	109.5	9.31
70204	10000	22.06	8.23	93.9	8.04	22.19	8.67	106.8	9.11
70204	20000	21.91	8.19	96.6	8.29	21.99	8.62	105.1	9.00
70204	30000	21.79	8.14	82.0	7.05	21.78	8.58	101.6	8.74
70204	40000	21.58	8.10	86.7	7.49	21.58	8.54	99.2	8.56
70204	50000	21.40	8.07	86.0	7.45	21.38	8.51	97.5	8.45
70204	60000	21.21	8.05	85.6	7.45	21.18	8.48	95.9	8.34
70204	70000	21.09	8.04	83.1	7.25	21.00	8.46	93.7	8.18
70204	80000	21.00	8.04	84.1	7.35	20.87	8.45	94.8	8.30
70204	90000	20.99	8.04	83.4	7.29	20.81	8.44	93.5	8.20
70204	100000	21.08	8.07	83.3	7.26	20.90	8.47	94.3	8.25
70204	110000	21.21	8.09	86.0	7.49	21.08	8.50	96.5	8.41
70204	120000	21.41	8.12	85.0	7.36	21.34	8.54	99.7	8.65
70204	130000	21.70	8.17	87.1	7.51	21.67	8.58	101.0	8.70
70204	150000	22.18	8.38	95.5	8.18	22.66	8.32	105.9	8.99
70204	160000	22.48	8.43	92.0	7.83	22.89	8.35	106.8	9.02
70204	170000	22.74	8.48	100.0	8.47	23.17	8.38	109.0	9.16
70204	180000	22.93	8.51	97.5	8.23	23.27	8.43	111.6	9.36
70204	190000	23.05	8.53	104.9	8.83	23.42	8.46	111.7	9.34
70204	200000	23.12	8.54	106.1	8.93	23.41	8.45	111.6	9.34
70204	210000	23.19	8.56	99.0	8.31	23.29	8.45	110.0	9.22
70204	220000	23.23	8.55	102.5	8.60	23.20	8.42	108.7	9.13
70204	230000	23.18	8.54	97.6	8.20	23.09	8.40	106.7	8.97
70304	0	23.07	8.51	94.4	7.95	23.00	8.38	104.9	8.85
70304	10000	22.94	8.49	98.4	8.31	22.87	8.35	103.2	8.72
70304	20000	22.77	8.45	93.3	7.90	22.73	8.31	99.6	8.44
70304	30000	22.67	8.41	97.9	8.31	22.54	8.27	97.6	8.30
70304	40000	22.50	8.38	86.0	7.32	22.34	8.23	95.1	8.12
70304	50000	22.30	8.33	90.2	7.71	22.12	8.19	93.2	7.99
70304	60000	22.11	8.29	92.4	7.92	21.92	8.15	91.2	7.85
70304	70000	21.84	8.25	88.6	7.64	21.74	8.12	89.5	7.73
70304	80000	21.80	8.24	89.0	7.68	21.65	8.12	89.6	7.75

70304	90000	21.73	8.24	84.7	7.32	21.70	8.12	90.1	7.79
70304	100000	21.78	8.25	83.1	7.17	21.81	8.13	91.8	7.91
70304	110000	21.89	8.26	87.0	7.49	22.02	8.15	92.4	7.94
70304	120000	22.04	8.28	85.0	7.30	22.24	8.16	93.5	8.00
70304	130000	22.21	8.31	87.2	7.47	22.45	8.19	94.9	8.08
70304	140000	22.34	8.34	90.2	7.70	22.72	8.24	97.2	8.24
70304	150000	22.54	8.38	89.7	7.62	22.93	8.27	99.3	8.38
70304	160000	22.75	8.42	96.1	8.14	23.15	8.31	100.7	8.47
70304	170000	22.90	8.46	91.3	7.71	23.26	8.33	102.5	8.60
70304	180000	23.01	8.49	86.5	7.29	23.35	8.36	103.5	8.67
70304	190000	23.13	8.51	95.0	7.99	23.41	8.37	104.1	8.71
70304	200000	23.15	8.52	96.6	8.12	23.39	8.36	103.6	8.67
70304	210000	23.18	8.51	97.1	8.15	23.32	8.35	101.4	8.49
70304	220000	23.17	8.51	91.7	7.71	23.23	8.32	99.9	8.39
70304	230000	23.18	8.51	87.0	7.31	23.16	8.29	97.9	8.23
70404	0	23.12	8.48	89.1	7.49	23.07	8.27	95.9	8.07
70404	10000	23.02	8.45	88.3	7.44	22.95	8.23	93.8	7.92
70404	20000	22.86	8.40	89.7	7.58	22.80	8.19	91.7	7.76
70404	30000	22.66	8.36	90.6	7.68	22.62	8.16	90.3	7.67
70404	40000	22.50	8.33	82.7	7.03	22.44	8.12	87.3	7.44
70404	50000	22.31	8.29	86.4	7.38	22.23	8.09	86.1	7.36
70404	60000	22.05	8.25	82.4	7.07	22.03	8.06	85.1	7.31
70404	70000	21.92	8.22	84.8	7.30	21.86	8.04	84.2	7.25
70404	80000	21.78	8.22	64.7	5.58	21.73	8.02	83.4	7.20
70404	90000	21.68	8.21	76.3	6.60	21.56	8.01	83.1	7.20
70404	100000	21.59	8.19	76.6	6.63	21.46	8.00	82.8	7.19
70404	110000	21.50	8.19	79.0	6.86	21.42	8.00	82.7	7.18
70404	120000	21.42	8.19	79.7	6.93	21.41	8.00	82.3	7.16
70404	130000	21.43	8.20	76.2	6.62	21.43	8.01	83.1	7.22
70404	140000	21.42	8.21	76.9	6.68	21.50	8.02	83.6	7.25
70404	150000	21.47	8.23	78.4	6.81	21.55	8.04	84.4	7.31
70404	160000	21.53	8.25	78.5	6.81	21.63	8.07	86.4	7.48
70404	170000	21.56	8.28	82.1	7.12	21.65	8.06	85.8	7.42
70404	180000	21.53	8.26	82.6	7.17	21.59	8.06	85.7	7.42
70404	190000	21.45	8.29	83.1	7.22	21.46	8.06	85.0	7.38
70404	200000	21.38	8.29	83.2	7.23	21.35	8.05	84.2	7.33
70404	210000	21.33	8.29	84.2	7.33	21.27	8.03	82.9	7.22
70404	220000	21.24	8.26	84.2	7.35	21.16	8.01	81.5	7.11
70404	230000	21.12	8.24	81.1	7.09	21.06	7.99	80.4	7.04
70504	0	20.95	8.21	78.5	6.88	20.91	7.97	78.9	6.93
70504	10000	20.75	8.19	77.6	6.84	20.71	7.95	77.4	6.82
70504	20000	20.55	8.17	76.9	6.80	20.52	7.93	76.3	6.75
70504	30000	20.42	8.16	72.3	6.40	20.32	7.92	75.3	6.69
70504	40000	20.20	8.14	73.7	6.56	20.14	7.90	74.3	6.63
70504	50000	20.03	8.12	74.1	6.61	19.96	7.88	73.5	6.57
70504	60000	19.86	8.11	72.4	6.49	19.78	7.88	73.1	6.56
70504	70000	19.72	8.11	72.0	6.47	19.66	7.87	72.6	6.53
70504	80000	19.63	8.11	71.7	6.45	19.55	7.86	72.8	6.56
70504	90000	19.53	8.11	70.4	6.35	19.50	7.86	72.8	6.57
70504	100000	19.56	8.12	74.1	6.68	19.56	7.87	73.7	6.64
70504	110000	19.67	8.13	77.4	6.96	19.76	7.90	75.5	6.78
70504	120000	19.87	8.17	73.5	6.58	20.04	7.93	76.8	6.85
70504	130000	20.17	8.20	76.9	6.85	20.44	7.95	78.7	6.97
70504	140000	20.49	8.24	75.4	6.67	20.80	7.98	80.8	7.10
70504	150000	20.74	8.27	79.3	6.98	21.09	8.01	83.2	7.28
70504	160000	21.00	8.31	83.3	7.30	21.27	8.03	85.2	7.43

70504	170000	21.14	8.33	86.4	7.55	21.21	8.05	86.1	7.52
70504	180000	21.20	8.35	88.0	7.68	21.29	8.07	87.8	7.65
70504	190000	21.20	8.37	88.1	7.68	21.33	8.09	87.7	7.64
70504	200000	21.22	8.37	83.8	7.31	21.22	8.08	87.4	7.63
70504	210000	21.15	8.37	84.7	7.40	21.12	8.07	86.8	7.59
70504	220000	21.05	8.34	84.3	7.37	20.99	8.06	85.9	7.53
70504	230000	20.91	8.33	84.9	7.45	20.83	8.02	83.7	7.36
70604	0	20.73	8.30	81.2	7.15	20.67	8.01	82.0	7.23
70604	10000	20.61	8.27	81.7	7.21	20.46	7.99	80.8	7.15
70604	20000	20.40	8.25	80.0	7.09	20.28	7.98	79.5	7.06
70604	30000	20.26	8.24	75.7	6.73	20.11	7.96	79.1	7.05
70604	40000	20.12	8.23	79.8	7.11	19.96	7.95	77.9	6.97
70604	50000	20.01	8.23	77.3	6.91	19.83	7.95	77.5	6.95
70604	60000	19.93	8.23	77.7	6.95	19.72	7.93	76.8	6.90
70604	70000	19.88	8.23	76.3	6.84	19.64	7.93	76.3	6.87
70604	80000	19.86	8.24	76.4	6.85	19.61	7.93	76.2	6.86
70604	90000	19.88	8.24	80.5	7.22	19.58	7.93	75.8	6.83
70604	100000	19.82	8.25	80.4	7.21	19.60	7.94	76.0	6.84
70604	110000	19.79	8.25	80.2	7.19	19.58	7.95	75.9	6.84
70604	120000	19.78	8.26	80.7	7.24	19.57	7.96	76.9	6.93
70604	130000	19.77	8.26	77.9	7.00	19.59	7.97	77.6	6.99
70604	140000	19.77	8.28	80.7	7.24	19.59	7.97	77.9	7.02
70604	150000	19.74	8.28	80.1	7.20	19.56	7.98	78.2	7.05
70604	160000	19.71	8.29	79.1	7.11	19.52	7.99	77.5	6.99
70604	170000	19.64	8.29	81.3	7.32	19.42	7.99	77.5	7.00
70604	180000	19.53	8.29	81.1	7.31	19.33	7.98	76.6	6.94
70604	190000	19.41	8.28	81.3	7.35	19.24	7.97	75.8	6.88
70604	200000	19.29	8.27	80.0	7.25	19.11	7.97	76.1	6.92
70604	210000	19.11	8.26	79.3	7.21	18.96	7.95	74.7	6.82
70604	220000	18.94	8.24	78.6	7.17	18.80	7.95	74.4	6.81
70604	230000	18.79	8.24	76.2	6.98	18.65	7.94	73.9	6.79
70704	0	18.62	8.23	77.1	7.08	18.50	7.93	72.8	6.71
70704	10000	18.50	8.22	76.5	7.05	18.38	7.93	73.1	6.75
70704	20000	18.38	8.21	76.5	7.06	18.25	7.92	72.9	6.74
70704	30000	18.30	8.21	68.2	6.31	18.16	7.92	72.8	6.75
70704	40000	18.20	8.20	74.6	6.91	18.07	7.91	72.3	6.72
70704	50000	18.12	8.20	76.0	7.05	17.98	7.90	71.6	6.66
70704	60000	18.04	8.19	74.6	6.93	17.90	7.90	71.6	6.67
70704	70000	17.99	8.19	74.6	6.94	17.84	7.89	71.6	6.69
70704	80000	17.95	8.20	75.6	7.04	17.82	7.90	71.6	6.68
70704	90000	17.95	8.20	75.4	7.02	17.83	7.90	71.8	6.70
70704	100000	17.98	8.20	76.2	7.09	17.87	7.91	72.5	6.77
70704	110000	18.04	8.22	76.9	7.15	17.98	7.94	74.1	6.89
70704	120000	18.12	8.23	77.3	7.17	18.06	7.95	74.9	6.96
70704	130000	18.20	8.25	75.2	6.97	18.13	7.96	75.5	7.01
70704	140000	18.33	8.26	79.0	7.30	18.28	7.97	75.5	6.98
70704	150000	18.44	8.28	81.3	7.49	18.37	7.99	76.7	7.08
70704	160000	18.53	8.30	81.5	7.51	18.44	8.00	77.6	7.16
70704	170000	18.52	8.30	80.6	7.42	18.44	8.00	78.0	7.19
70704	180000	18.48	8.31	81.5	7.51	18.43	8.01	78.6	7.25
70704	190000	18.46	8.31	81.9	7.55	18.42	8.01	79.2	7.31
70704	200000	18.49	8.31	80.3	7.39	18.36	8.02	78.1	7.21
70704	210000	18.40	8.30	81.4	7.51	18.29	8.01	76.9	7.11
70704	220000	18.32	8.30	78.1	7.22	18.18	8.01	78.1	7.24
70704	230000	18.20	8.29	80.1	7.42	18.11	8.00	76.6	7.11
70804	0	18.13	8.28	79.8	7.41	18.01	8.00	77.2	7.18

70804	10000	18.05	8.28	80.0	7.44	17.93	7.98	75.9	7.08
70804	20000	17.97	8.27	80.0	7.45	17.85	7.98	76.1	7.10
70804	30000	17.90	8.27	78.3	7.30	17.77	7.99	76.4	7.14
70804	40000	17.83	8.27	78.1	7.29	17.70	7.99	75.9	7.11
70804	50000	17.80	8.27	77.6	7.25	17.64	7.99	76.1	7.13
70804	60000	17.74	8.27	78.7	7.36	17.58	7.98	74.5	7.00
70804	70000	17.72	8.28	74.1	6.94	17.56	7.99	75.6	7.10
70804	80000	17.68	8.29	79.4	7.44	17.55	8.00	76.5	7.18
70804	90000	17.69	8.29	79.5	7.44	17.56	8.00	76.4	7.17
70804	100000	17.73	8.31	79.3	7.42	17.63	8.00	75.8	7.11
70804	110000	17.80	8.32	80.7	7.54	17.70	8.01	75.6	7.08
70804	120000	17.87	8.32	81.1	7.57	17.80	8.03	77.1	7.20
70804	130000	17.97	8.34	80.9	7.53	17.95	8.04	77.8	7.25
70804	140000	18.08	8.35	81.2	7.54	18.07	8.05	77.0	7.15
70804	150000	18.18	8.37	82.7	7.66	18.23	8.07	78.3	7.25
70804	160000	18.24	8.38	83.4	7.72	18.26	8.08	79.5	7.36
70804	170000	18.22	8.38	83.6	7.74	18.27	8.09	79.9	7.39
70804	180000	18.18	8.38	83.8	7.76	18.24	8.09	80.3	7.44
70804	190000	18.15	8.38	83.3	7.73	18.21	8.09	80.3	7.43
70804	200000	18.09	8.37	81.6	7.58	18.15	8.08	80.0	7.42
70804	210000	18.00	8.35	80.8	7.52	18.06	8.07	79.0	7.34
70804	220000	17.92	8.34	80.9	7.54	17.96	8.06	78.7	7.33
70804	230000	17.85	8.33	80.1	7.48	17.87	8.05	78.0	7.28
70904	0	17.79	8.32	80.5	7.52	17.80	8.04	76.6	7.16
70904	10000	17.77	8.31	80.0	7.47	17.73	8.03	75.9	7.10
70904	20000	17.73	8.31	79.4	7.43	17.66	8.03	76.0	7.12
70904	30000	17.66	8.30	79.5	7.44	17.59	8.02	75.5	7.08
70904	40000	17.59	8.30	79.8	7.49	17.50	8.02	75.9	7.14
70904	50000	17.51	8.30	78.3	7.36	17.42	8.02	75.5	7.11
70904	60000	17.43	8.30	78.7	7.41	17.35	8.01	75.5	7.12
70904	70000	17.39	8.31	80.1	7.55	17.31	8.02	75.2	7.09
70904	80000	17.42	8.31	80.4	7.57	17.32	8.02	75.4	7.12
70904	90000	17.51	8.32	81.3	7.64	17.47	8.03	76.4	7.19
70904	100000	17.66	8.34	81.3	7.62	17.68	8.05	77.2	7.23
70904	110000	17.87	8.35	82.6	7.71	17.97	8.07	79.1	7.36
70904	120000	18.20	8.37	82.6	7.65	18.28	8.09	80.9	7.48
70904	130000	18.29	8.38	84.5	7.82	18.40	8.10	81.0	7.47
70904	140000	18.44	8.39	85.2	7.86	18.54	8.11	81.8	7.53
70904	150000	18.53	8.40	85.6	7.88	18.61	8.12	83.1	7.63
70904	160000	18.48	8.41	87.0	8.02	18.62	8.12	82.5	7.58
70904	170000	18.51	8.41	85.4	7.86	18.63	8.12	82.4	7.57
70904	180000	18.51	8.40	86.4	7.96	18.67	8.12	83.8	7.69
70904	190000	18.52	8.40	85.8	7.90	18.64	8.12	82.0	7.53
70904	200000	18.48	8.40	85.1	7.84	18.61	8.12	81.7	7.50
70904	210000	18.41	8.39	84.3	7.78	18.47	8.11	82.1	7.56
70904	220000	18.34	8.39	82.4	7.62	18.38	8.11	81.7	7.54
70904	230000	18.24	8.38	81.9	7.58	18.29	8.10	80.7	7.47
71004	0	18.19	8.38	82.4	7.64	18.20	8.09	80.1	7.43
71004	10000	18.11	8.36	81.0	7.52	18.10	8.09	79.8	7.41
71004	20000	18.04	8.35	80.0	7.44	18.02	8.07	78.3	7.28
71004	30000	17.96	8.35	81.7	7.61	17.94	8.07	77.9	7.25
71004	40000	17.93	8.35	76.6	7.14	17.89	8.07	77.9	7.26
71004	50000	17.89	8.34	79.1	7.37	17.84	8.06	77.0	7.18
71004	60000	17.85	8.34	79.6	7.43	17.80	8.06	77.5	7.24
71004	70000	17.83	8.34	75.8	7.08	17.78	8.06	76.9	7.19
71004	80000	17.86	8.34	79.0	7.37	17.83	8.07	78.5	7.33

71004	90000	17.96	8.35	79.0	7.36	17.99	8.08	78.2	7.27
71004	100000	18.17	8.37	80.6	7.47	18.25	8.09	78.6	7.28
71004	110000	18.43	8.38	80.0	7.37	18.56	8.10	79.2	7.28
71004	120000	18.69	8.40	82.0	7.52	18.97	8.12	81.7	7.46
71004	130000	19.01	8.42	78.9	7.19	19.27	8.13	82.9	7.52
71004	140000	19.36	8.45	85.0	7.69	19.65	8.15	84.8	7.63
71004	150000	19.62	8.47	84.9	7.64	19.97	8.16	85.0	7.60
71004	160000	19.84	8.49	83.5	7.48	20.20	8.20	87.0	7.74
71004	170000	20.00	8.50	85.9	7.68	20.33	8.20	87.8	7.79
71004	180000	20.11	8.51	83.1	7.41	20.47	8.22	88.4	7.82
71004	190000	20.19	8.52	84.8	7.55	20.55	8.22	88.6	7.83
71004	200000	20.24	8.51	84.7	7.53	20.52	8.24	89.9	7.95
71004	210000	20.27	8.51	83.5	7.42	20.48	8.23	88.3	7.81
71004	220000	20.29	8.50	81.1	7.21	20.44	8.20	87.3	7.73
71004	230000	20.25	8.48	81.7	7.27	20.35	8.19	86.6	7.69
71104	0	20.17	8.46	80.3	7.15	20.21	8.17	84.7	7.54
71104	10000	20.04	8.45	83.5	7.45	20.09	8.15	84.3	7.51
71104	20000	19.92	8.43	80.3	7.19	19.97	8.14	82.1	7.34
71104	30000	19.85	8.41	82.6	7.41	19.86	8.13	81.3	7.29
71104	40000	19.78	8.40	79.9	7.17	19.75	8.11	80.6	7.24
71104	50000	19.69	8.39	77.5	6.96	19.66	8.10	79.8	7.18
71104	60000	19.63	8.38	79.8	7.18	19.59	8.10	79.4	7.15
71104	70000	19.60	8.38	80.4	7.24	19.58	8.11	79.3	7.15
71104	80000	19.63	8.38	79.0	7.11	19.63	8.10	79.1	7.12
71104	90000	19.69	8.39	74.4	6.69	19.69	8.10	78.8	7.08
71104	100000	19.81	8.40	81.3	7.29	19.82	8.13	80.2	7.19
71104	110000	19.97	8.42	80.9	7.23	20.03	8.15	81.2	7.25
71104	120000	20.19	8.44	80.0	7.12	20.29	8.17	82.7	7.35
71104	130000	20.42	8.46	81.6	7.23	20.59	8.19	83.4	7.36
71104	140000	20.66	8.50	85.5	7.54	20.85	8.21	85.1	7.47
71104	150000	20.83	8.53	84.2	7.40	20.99	8.23	85.6	7.50
71104	160000	20.90	8.55	84.9	7.45	21.05	8.26	86.8	7.60
71104	170000	20.91	8.56	87.3	7.67	21.03	8.27	87.5	7.66
71104	180000	20.87	8.57	83.6	7.34	21.00	8.27	86.4	7.57
71104	190000	20.79	8.56	85.4	7.51	20.94	8.27	86.5	7.59
71104	200000	20.67	8.54	83.4	7.36	20.79	8.25	85.1	7.49
71104	210000	20.45	8.52	84.3	7.46	20.61	8.23	83.3	7.35
71104	220000	20.30	8.50	83.0	7.38	20.42	8.21	81.9	7.26
71104	230000	20.18	8.48	78.8	7.02	20.27	8.20	80.8	7.18
71204	0	20.06	8.46	83.0	7.40	20.13	8.17	79.4	7.08
71204	10000	19.95	8.44	79.7	7.13	20.00	8.16	78.7	7.04
71204	20000	19.83	8.43	79.9	7.17	19.89	8.15	78.6	7.04
71204	30000	19.76	8.42	79.6	7.15	19.79	8.14	77.6	6.96
71204	40000	19.68	8.42	77.5	6.97	19.70	8.13	77.3	6.95
71204	50000	19.61	8.41	78.5	7.07	19.62	8.12	77.2	6.95
71204	60000	19.56	8.40	80.1	7.22	19.56	8.10	76.3	6.88
71204	70000	19.55	8.41	79.5	7.17	19.55	8.12	77.2	6.96
71204	80000	19.59	8.42	78.9	7.11	19.61	8.13	76.4	6.88
71204	90000	19.69	8.42	78.0	7.01	19.77	8.13	77.3	6.94
71204	100000	19.89	8.45	79.4	7.11	20.00	8.15	78.2	6.98
71204	110000	20.17	8.48	68.4	6.09	20.22	7.94	87.0	7.66
71204	120000	20.39	7.95	85.5	7.50	22.56	7.95	88.7	7.46
71204	130000	20.62	7.97	89.8	7.84	lure - No data Collected			
71204	140000	20.97	8.01	90.8	7.88				
71204	150000	21.28	8.05	92.5	7.98				
71204	160000	21.50	8.08	94.0	8.08				

71204	170000	21.67	8.10	94.2	8.06
71204	180000	21.80	8.10	94.7	8.09
71204	190000	21.90	8.11	94.0	8.01
71204	200000	21.98	8.12	94.5	8.05
71204	210000	22.08	8.12	94.0	7.98
71204	220000	22.08	8.11	94.3	8.01
71204	230000	22.11	8.09	94.0	7.97
71304	0	22.18	8.08	92.6	7.85
71304	10000	22.22	8.07	92.1	7.80
71304	20000	22.22	8.06	91.6	7.76
71304	30000	22.21	8.04	89.5	7.58
71304	40000	22.18	8.03	88.5	7.50
71304	50000	22.12	8.00	87.8	7.45
71304	60000	22.07	7.99	86.8	7.37
71304	70000	22.02	7.98	86.6	7.37
71304	80000	22.01	7.99	86.6	7.37
71304	90000	22.07	8.00	86.3	7.33
71304	100000	22.24	8.01	89.0	7.54
71304	110000	22.39	8.03	87.9	7.42
71304	120000	22.55	8.05	79.8	6.72
71304	130000	22.72	8.07	88.6	7.44
71304	140000	23.11	8.12	89.2	7.42
71304	150000	23.30	8.14	90.2	7.49
71304	160000	23.20	8.18	93.3	7.75
71304	170000	23.27	8.21	95.5	7.93
71304	180000	23.31	8.23	94.0	7.80
71304	190000	23.32	8.24	95.3	7.91
71304	200000	23.38	8.23	85.5	7.08
71304	210000	23.37	8.22	90.2	7.47
71304	220000	23.19	8.18	90.9	7.56
71304	230000	22.78	8.17	90.3	7.57
71404	0	22.55	8.15	88.2	7.43
71404	10000	22.32	8.11	88.0	7.44
71404	20000	22.11	8.08	86.5	7.34
71404	30000	21.89	8.06	86.0	7.33
71404	40000	21.72	8.04	84.1	7.19
71404	50000	21.57	8.03	82.3	7.06
71404	60000	21.41	8.02	81.4	7.01
71404	70000	21.25	8.01	81.5	7.04
71404	80000	21.18	8.01	83.1	7.19
71404	90000	21.21	8.02	82.4	7.12
71404	100000	21.32	8.04	83.1	7.16
71404	110000	21.42	8.06	83.8	7.21
71404	120000	21.56	8.08	84.6	7.26
71404	130000	21.75	8.12	79.7	6.82
71404	140000	21.88	8.14	86.4	7.37
71404	150000	22.07	8.17	87.9	7.47
71404	160000	22.23	8.21	91.6	7.76
71404	170000	22.38	8.22	89.8	7.59
71404	180000	22.53	8.25	94.9	7.99
71404	190000	22.58	8.26	94.3	7.94
71404	200000	22.56	8.27	94.1	7.92
71404	210000	22.51	8.27	84.0	7.08
71404	220000	22.46	8.25	90.3	7.61
71404	230000	22.42	8.24	90.8	7.66
71504	0	22.36	8.22	92.9	7.85

71504	10000	22.27	8.20	88.7	7.51
71504	20000	22.07	8.17	87.2	7.41
71504	30000	21.91	8.15	89.1	7.60
71504	40000	21.80	8.13	86.2	7.36
71504	50000	21.65	8.11	83.6	7.16
71504	60000	21.54	8.10	83.2	7.14
71504	70000	21.45	8.10	82.8	7.12
71504	80000	21.41	8.10	84.6	7.28
71504	90000	21.43	8.11	85.4	7.34
71504	100000	21.53	8.12	85.4	7.33
71504	110000	21.72	8.14	85.5	7.31
71504	120000	22.00	8.18	87.0	7.40
71504	130000	22.25	8.22	88.6	7.50
71504	140000	22.61	8.27	89.5	7.52
71504	150000	22.91	8.31	92.1	7.70
71504	160000	23.23	8.37	94.9	7.88
71504	170000	23.44	8.41	95.8	7.93
71504	180000	23.66	8.44	98.5	8.12
71504	190000	23.72	8.45	99.2	8.17
71504	200000	23.74	8.45	98.7	8.13
71504	210000	23.70	8.43	98.8	8.13
71504	220000	23.61	8.40	96.7	7.98
71504	230000	23.47	8.38	95.8	7.92
71604	0	23.33	8.34	93.3	7.74
71604	10000	23.20	8.31	90.6	7.53
71604	20000	23.03	8.27	88.7	7.39
71604	30000	22.81	8.24	87.8	7.35
71604	40000	22.69	8.21	87.3	7.33
71604	50000	22.60	8.19	85.0	7.15
71604	60000	22.52	8.18	84.7	7.13
71604	70000	22.42	8.17	83.9	7.08
71604	80000	22.36	8.16	84.7	7.15
71604	90000	22.34	8.16	85.7	7.24
71604	100000	22.33	8.16	83.4	7.05
71604	110000	22.34	8.18	71.6	6.05
71604	120000	22.39	8.18	80.4	6.79
71604	130000	22.46	8.18	82.8	6.98
71604	140000	22.62	8.22	84.7	7.12
71604	150000	22.72	8.25	84.8	7.11
71604	160000	22.85	8.27	86.1	7.20
71604	170000	22.94	8.30	86.6	7.23
71604	180000	22.99	8.31	88.1	7.36
71604	190000	23.04	8.34	88.9	7.41
71604	200000	22.95	8.34	91.4	7.64
71604	210000	22.90	8.33	87.1	7.28
71604	220000	22.78	8.33	90.4	7.57
71604	230000	22.61	8.31	89.1	7.49
71704	0	22.49	8.29	87.2	7.35
71704	10000	22.31	8.26	86.1	7.28
71704	20000	22.12	8.24	86.9	7.37
71704	30000	21.95	8.21	85.1	7.24
71704	40000	21.80	8.19	83.0	7.09
71704	50000	21.61	8.17	80.2	6.87
71704	60000	21.43	8.16	81.9	7.04
71704	70000	21.29	8.14	81.4	7.02
71704	80000	21.19	8.14	79.8	6.90

71704	90000	21.13	8.14	79.7	6.90
71704	100000	21.17	8.15	81.0	7.00
71704	110000	21.29	8.16	80.8	6.97
71704	120000	21.44	8.18	83.9	7.22
71704	130000	21.64	8.20	83.5	7.15
71704	140000	21.83	8.24	84.9	7.25
71704	150000	22.17	8.30	89.5	7.58
71704	160000	22.47	8.35	92.0	7.75
71704	170000	22.66	8.39	92.3	7.75
71704	180000	22.82	8.42	93.8	7.85
71704	190000	22.95	8.46	86.5	7.23
71704	200000	23.00	8.47	87.6	7.31
71704	210000	22.99	8.48	95.9	8.00
71704	220000	22.96	8.47	95.4	7.96
71704	230000	22.92	8.46	95.2	7.96
71804	0	22.85	8.44	94.5	7.91
71804	10000	22.74	8.42	92.4	7.75
71804	20000	22.61	8.39	91.6	7.70
71804	30000	22.44	8.36	89.7	7.57
71804	40000	22.31	8.33	87.5	7.40
71804	50000	22.16	8.30	86.6	7.35
71804	60000	22.03	8.28	85.3	7.25
71804	70000	21.91	8.26	85.4	7.27
71804	80000	21.83	8.26	84.9	7.24
71804	90000	21.80	8.26	84.2	7.19
71804	100000	21.84	8.26	84.9	7.24
71804	110000	21.97	8.29	85.6	7.29
71804	120000	22.18	8.32	85.6	7.25
71804	130000	22.40	8.35	87.7	7.40
71804	140000	22.65	8.40	89.7	7.53
71804	150000	22.90	8.45	92.3	7.71
71804	160000	23.11	8.49	93.2	7.76
71804	170000	23.30	8.53	95.0	7.88
71804	180000	23.41	8.55	95.2	7.88
71804	190000	23.49	8.58	96.8	8.00
71804	200000	23.47	8.58	96.9	8.01
71804	210000	23.43	8.57	95.0	7.86
71804	220000	23.36	8.56	96.3	7.98
71804	230000	23.32	8.55	95.2	7.90
71904	0	23.21	8.51	94.4	7.85
71904	10000	23.13	8.49	93.2	7.76
71904	20000	22.98	8.46	91.2	7.61
71904	30000	22.87	8.43	91.2	7.63
71904	40000	22.74	8.40	88.8	7.45
71904	50000	22.58	8.37	87.4	7.35
71904	60000	22.42	8.35	87.9	7.41
71904	70000	22.26	8.33	85.5	7.24
71904	80000	22.17	8.31	85.0	7.21
71904	90000	22.12	8.31	85.0	7.21
71904	100000	22.15	8.31	85.1	7.22
71904	110000	22.32	8.33	86.4	7.30
71904	120000	22.63	8.36	90.6	7.62
71904	130000	22.97	8.40	94.2	7.86
71904	140000	23.19	8.42	91.9	7.64
71904	150000	23.34	8.45	95.4	7.91
71904	160000	23.50	8.48	94.1	7.78

71904	170000	23.67	8.52	96.5	7.95				
71904	180000	23.78	8.55	97.4	8.01				
71904	190000	23.83	8.56	99.5	8.17				
71904	200000	23.91	8.56	97.9	8.03				
71904	210000	23.95	8.56	97.7	8.01				
71904	220000	23.99	8.54	96.5	7.90				
71904	230000	24.04	8.54	95.9	7.85				
72004	0	24.04	8.51	94.4	7.73				
72004	10000	23.96	8.48	92.4	7.57				
72004	20000	23.79	8.45	90.7	7.46				
72004	30000	23.59	8.41	89.2	7.36				
72004	40000	23.37	8.37	87.4	7.24				
72004	50000	23.18	8.34	86.4	7.19				
72004	60000	22.97	8.30	84.7	7.07				
72004	70000	22.83	8.29	83.5	6.99				
72004	80000	22.74	8.27	83.8	7.03				
72004	90000	22.77	8.28	85.0	7.12				
72004	100000	22.88	8.29	85.2	7.13				
72004	110000	23.08	8.31	87.6	7.30				
72004	120000	23.35	8.34	88.5	7.34				
72004	130000	23.62	8.38	89.8	7.41	23.83	7.91	70.6	5.94
72004	140000	23.99	8.03	96.6	8.09	24.15	7.96	68.2	5.70
72004	150000	24.17	8.08	98.2	8.20	24.37	8.00	71.7	5.97
72004	160000	24.39	8.13	99.9	8.30	24.54	8.01	72.4	6.01
72004	170000	24.58	8.17	101.8	8.44	24.66	8.05	70.1	5.81
72004	180000	24.66	8.19	101.3	8.38	24.76	8.05	70.0	5.79
72004	190000	24.71	8.19	101.8	8.41	24.79	8.08	73.1	6.04
72004	200000	24.72	8.19	101.0	8.34	24.75	8.07	73.7	6.10
72004	210000	24.65	8.18	100.4	8.31	24.67	8.07	73.7	6.10
72004	220000	24.54	8.16	99.0	8.21	24.58	8.04	68.9	5.72
72004	230000	24.47	8.13	97.2	8.07	24.46	8.01	69.6	5.79
72104	0	24.41	8.11	94.9	7.89	24.36	7.99	68.5	5.71
72104	10000	24.31	8.08	94.8	7.89	24.21	7.97	67.6	5.65
72104	20000	24.16	8.06	92.5	7.72	24.10	7.93	69.8	5.85
72104	30000	24.01	8.03	91.2	7.63	23.94	7.91	60.1	5.05
72104	40000	23.91	8.01	89.2	7.49	23.82	7.88	64.4	5.42
72104	50000	23.84	7.99	88.5	7.43	23.70	7.86	67.2	5.67
72104	60000	23.74	7.98	86.6	7.29	23.58	7.85	57.9	4.89
72104	70000	23.70	7.96	87.2	7.35	23.53	7.84	59.9	5.07
72104	80000	23.66	7.97	86.2	7.27	23.51	7.84	59.0	4.99
72104	90000	23.67	7.97	86.9	7.32	23.55	7.85	58.8	4.98
72104	100000	23.76	7.98	76.6	6.44	23.67	7.85	57.4	4.84
72104	110000	23.86	8.00	86.1	7.23	23.81	7.86	55.1	4.64
72104	120000	23.96	8.01	86.9	7.28	23.97	7.87	58.9	4.95
72104	130000	24.12	8.04	89.7	7.49	24.18	7.90	61.4	5.14
72104	140000	24.26	8.07	88.6	7.39	24.35	7.94	65.9	5.49
72104	150000	24.43	8.10	92.6	7.69	24.48	7.98	64.9	5.40
72104	160000	24.49	8.11	89.5	7.43	24.51	7.96	63.9	5.31
72104	170000	24.56	8.15	95.5	7.92	24.52	8.00	64.7	5.38
72104	180000	24.64	8.18	96.9	8.02	24.67	8.04	65.7	5.45
72104	190000	24.71	8.20	97.4	8.06	24.79	8.03	63.7	5.27
72104	200000	24.76	8.20	96.5	7.97	24.80	8.06	60.9	5.03
72104	210000	24.79	8.21	96.4	7.96	24.79	8.01	64.7	5.35
72104	220000	24.75	8.20	95.5	7.89	24.74	8.02	66.8	5.53
72104	230000	24.72	8.18	94.1	7.78	24.68	8.01	64.5	5.34
72204	0	24.68	8.16	92.8	7.68	24.61	8.01	64.0	5.31

72204	10000	24.59	8.14	90.8	7.53	24.54	7.98	58.3	4.84
72204	20000	24.52	8.13	90.0	7.47	24.46	7.93	62.9	5.23
72204	30000	24.44	8.11	88.6	7.36	24.37	7.93	57.3	4.77
72204	40000	24.34	8.08	88.0	7.33	24.26	7.91	59.8	4.99
72204	50000	24.21	8.05	86.2	7.19	24.12	7.88	56.5	4.73
72204	60000	24.07	8.02	84.7	7.08	23.98	7.84	55.6	4.66
72204	70000	23.88	7.99	82.9	6.96	23.84	7.85	54.5	4.58
72204	80000	23.77	7.97	82.7	6.96	23.70	7.81	56.6	4.77
72204	90000	23.70	7.97	82.0	6.91	23.63	7.86	53.7	4.54
72204	100000	23.72	7.97	82.9	6.98	23.69	7.87	57.0	4.81
72204	110000	23.81	7.98	83.7	7.04	23.82	7.87	53.8	4.53
72204	120000	23.93	8.00	86.0	7.21	24.00	7.88	62.3	5.23
72204	130000	24.11	8.03	87.9	7.35	24.18	7.90	60.8	5.08
72204	140000	24.31	8.07	90.3	7.52	24.39	7.94	58.3	4.85
72204	150000	24.45	8.10	92.0	7.65	24.56	7.95	63.0	5.23
72204	160000	24.53	8.13	93.1	7.72	24.66	7.96	64.5	5.35
72204	170000	24.60	8.15	95.1	7.88	24.70	8.02	64.1	5.30
72204	180000	24.60	8.16	95.0	7.87	24.70	8.04	64.9	5.37
72204	190000	24.57	8.16	94.7	7.85	24.59	8.05	66.7	5.53
72204	200000	24.48	8.16	94.3	7.83	24.47	8.04	65.4	5.44
72204	210000	24.39	8.14	93.9	7.81	24.38	8.02	67.6	5.63
72204	220000	24.30	8.13	92.1	7.67	24.26	7.99	66.0	5.51
72204	230000	24.19	8.11	91.0	7.59	24.17	7.97	63.6	5.31
72304	0	24.11	8.08	89.2	7.46	24.03	7.94	61.4	5.14
72304	10000	23.91	8.05	87.5	7.34	23.83	7.92	66.6	5.61
72304	20000	23.68	8.02	85.7	7.22	23.64	7.89	64.1	5.41
72304	30000	23.49	7.99	84.0	7.10	23.45	7.87	60.8	5.15
72304	40000	23.28	7.98	83.3	7.08	23.24	7.85	60.6	5.16
72304	50000	23.11	7.96	82.4	7.02	23.03	7.83	58.8	5.02
72304	60000	22.96	7.95	82.0	7.01	22.86	7.82	56.9	4.88
72304	70000	22.84	7.95	80.8	6.92	22.70	7.80	58.5	5.03
72304	80000	22.74	7.95	80.9	6.94	22.60	7.82	57.0	4.91
72304	90000	22.75	7.96	81.7	7.01	22.61	7.83	58.6	5.04
72304	100000	22.85	7.98	82.2	7.03	22.74	7.84	57.6	4.95
72304	110000	23.01	8.00	82.9	7.08	22.93	7.85	57.5	4.92
72304	120000	23.21	8.03	84.5	7.18	23.23	7.89	60.3	5.14
72304	130000	23.46	8.06	84.5	7.15	23.52	7.92	57.7	4.88
72304	140000	23.69	8.09	88.6	7.47	23.77	7.95	64.0	5.39
72304	150000	23.92	8.14	91.1	7.64	24.03	7.97	63.5	5.32
72304	160000	24.12	8.18	90.2	7.53	24.14	7.99	60.3	5.05
72304	170000	24.14	8.20	94.1	7.86	24.15	8.00	62.9	5.26
72304	180000	24.09	8.20	92.9	7.77	24.13	8.04	66.6	5.57
72304	190000	24.08	8.22	92.7	7.75	24.13	8.04	64.5	5.39
72304	200000	24.06	8.22	93.6	7.84	24.09	8.03	63.6	5.32
72304	210000	23.97	8.22	91.6	7.68	23.97	8.00	55.8	4.68
72304	220000	23.90	8.21	92.0	7.72	23.83	8.01	65.4	5.50
72304	230000	23.75	8.20	90.3	7.60	23.67	8.01	63.7	5.37
72404	0	23.64	8.18	88.1	7.43	23.56	7.99	63.2	5.34
72404	10000	23.56	8.16	87.7	7.41	23.49	7.99	58.6	4.97
72404	20000	23.52	8.16	88.3	7.46	23.41	7.93	60.1	5.10
72404	30000	23.48	8.14	86.2	7.29	23.27	7.92	58.3	4.96
72404	40000	23.33	8.11	84.9	7.20	23.11	7.91	58.0	4.95
72404	50000	23.14	8.09	82.7	7.04	22.94	7.92	56.2	4.81
72404	60000	22.92	8.06	81.1	6.93	22.80	7.87	56.1	4.81
72404	70000	22.74	8.04	79.8	6.85	22.63	7.84	54.9	4.72
72404	80000	22.61	8.03	79.1	6.80	22.49	7.84	52.8	4.56

72404	90000	22.53	8.02	79.4	6.84	22.42	7.86	53.4	4.62
72404	100000	22.51	8.02	79.5	6.85	22.41	7.88	55.1	4.76
72404	110000	22.55	8.02	80.0	6.89	22.49	7.90	55.1	4.76
72404	120000	22.67	8.04	81.0	6.96	22.69	7.89	65.2	5.61
72404	130000	22.84	8.06	83.5	7.15	22.88	7.88	53.8	4.61
72404	140000	23.05	8.09	84.2	7.18	23.13	7.90	56.2	4.79
72404	150000	23.10	8.11	85.6	7.29	23.16	7.94	57.1	4.87
72404	160000	23.13	8.13	86.2	7.34	23.26	7.98	57.0	4.85
72404	170000	23.28	8.16	88.7	7.53	23.40	7.98	60.1	5.10
72404	180000	23.33	8.20	90.2	7.65	23.45	8.04	58.5	4.95
72404	190000	23.30	8.22	90.2	7.66	23.45	8.07	61.8	5.24
72404	200000	23.29	8.22	91.1	7.74	23.41	8.06	67.3	5.71
72404	210000	23.33	8.22	89.9	7.63	23.31	8.05	64.4	5.47
72404	220000	23.23	8.21	89.7	7.63	23.18	8.03	63.3	5.40
72404	230000	23.07	8.19	87.9	7.49	23.04	8.01	67.1	5.73
72504	0	23.00	8.16	85.8	7.32	22.95	8.01	61.4	5.25
72504	10000	22.96	8.15	85.8	7.33	22.89	7.99	62.6	5.36
72504	20000	22.97	8.15	85.2	7.28	22.79	7.97	59.3	5.09
72504	30000	22.92	8.13	85.6	7.32	22.67	7.93	61.0	5.25
72504	40000	22.76	8.10	83.2	7.14	22.50	7.90	59.6	5.15
72504	50000	22.57	8.07	81.8	7.04	22.30	7.91	58.8	5.10
72504	60000	22.40	8.05	80.1	6.92	22.13	7.90	57.5	5.00
72504	70000	22.21	8.03	78.6	6.81	21.96	7.86	60.0	5.23
72504	80000	22.04	8.01	76.6	6.66	21.81	7.85	53.0	4.64
72504	90000	21.93	8.01	77.4	6.74	21.74	7.86	55.6	4.86
72504	100000	21.93	8.03	78.5	6.84	21.80	7.87	53.4	4.67
72504	110000	22.02	8.04	77.8	6.76	21.92	7.86	53.6	4.68
72504	120000	22.20	8.05	78.9	6.84	22.14	7.86	54.8	4.76
72504	130000	22.40	8.06	80.9	6.98	22.39	7.90	57.8	5.00
72504	140000	22.58	8.07	68.5	5.89	22.67	7.92	55.3	4.76
72504	150000	22.82	8.09	80.1	6.86	22.96	7.92	58.4	5.00
72504	160000	23.08	8.12	84.4	7.19	23.16	7.91	56.4	4.80
72504	170000	23.18	8.15	84.6	7.20	23.36	7.96	60.9	5.17
72504	180000	23.29	8.17	87.5	7.43	23.43	8.01	60.1	5.10
72504	190000	23.35	8.20	88.0	7.46	23.43	8.08	63.5	5.38
72504	200000	23.29	8.22	89.7	7.61	23.43	8.09	62.7	5.32
72504	210000	23.23	8.23	87.9	7.48	23.37	8.02	62.2	5.28
72504	220000	23.16	8.22	89.2	7.59	23.27	8.00	63.5	5.40
72504	230000	23.09	8.20	89.5	7.63	23.18	8.02	66.3	5.65
72604	0	23.12	8.19	89.0	7.58	23.11	8.06	64.4	5.49
72604	10000	23.16	8.20	87.8	7.47	23.08	8.02	63.2	5.39
72604	20000	23.17	8.20	86.6	7.37	23.04	7.97	64.0	5.46
72604	30000	23.20	8.19	86.0	7.31	22.98	7.95	61.0	5.21
72604	40000	23.14	8.16	83.5	7.11	22.87	7.91	61.7	5.29
72604	50000	23.01	8.14	82.5	7.04	22.72	7.90	58.0	4.99
72604	60000	22.85	8.11	82.2	7.04	22.57	7.88	56.5	4.87
72604	70000	22.68	8.08	80.4	6.90	22.41	7.88	56.2	4.86
72604	80000	22.54	8.06	79.1	6.81	22.29	7.85	56.2	4.87
72604	90000	22.44	8.04	77.3	6.67	22.23	7.90	53.5	4.64
72604	100000	22.41	8.04	77.2	6.66	22.32	7.90	57.6	4.99
72604	110000	22.48	8.05	77.0	6.63	22.46	7.89	57.9	5.00
72604	120000	22.60	8.05	78.0	6.71	22.66	7.87	51.6	4.44
72604	130000	22.87	8.07	78.5	6.71	22.90	7.89	56.5	4.83
72604	140000	23.14	8.08	78.3	6.66	23.23	7.90	58.9	5.01
72604	150000	23.36	8.11	80.0	6.78	23.49	7.92	57.0	4.83
72604	160000	23.50	8.13	81.2	6.87	23.68	7.94	56.9	4.80

72604	170000	23.64	8.16	83.2	7.02	23.80	7.97	57.8	4.86
72604	180000	23.92	8.21	83.2	6.98	23.90	8.01	61.1	5.13
72604	190000	23.88	8.23	84.6	7.10	23.94	8.06	71.7	6.02
72604	200000	23.82	8.25	92.6	7.78	24.09	8.08	67.9	5.69
72604	210000	23.80	8.24	92.1	7.74	24.06	8.04	66.2	5.55
72604	220000	23.84	8.24	91.2	7.66	23.91	7.95	62.1	5.21
72604	230000	23.90	8.22	91.5	7.68	23.80	8.07	60.1	5.06
72704	0	23.95	8.22	89.7	7.52	23.79	8.06	67.1	5.65
72704	10000	23.96	8.21	89.8	7.53	23.76	8.03	58.9	4.97
72704	20000	23.93	8.18	87.0	7.30	23.71	7.98	63.8	5.38
72704	30000	23.85	8.15	85.7	7.20	23.63	7.94	62.3	5.26
72704	40000	23.72	8.13	84.0	7.07	23.50	7.95	61.6	5.21
72704	50000	23.51	8.10	83.3	7.04	23.37	7.92	57.9	4.91
72704	60000	23.30	8.07	81.0	6.88	23.22	7.90	56.5	4.81
72704	70000	23.11	8.05	79.3	6.76	23.08	7.86	51.5	4.40
72704	80000	22.97	8.03	78.8	6.73	22.92	7.86	54.0	4.62
72704	90000	22.91	8.03	77.5	6.63	22.86	7.90	53.9	4.62
72704	100000	22.94	8.04	78.4	6.70	22.90	7.91	55.1	4.72
72704	110000	23.08	8.05	80.4	6.85	23.06	7.91	55.2	4.71
72704	120000	23.30	8.06	80.6	6.84	23.28	7.90	54.7	4.65
72704	130000	23.56	8.09	81.3	6.86	23.54	7.93	55.8	4.72
72704	140000	23.72	8.10	72.1	6.07	23.78	7.96	58.8	4.96
72704	150000	23.86	8.12	80.2	6.73	24.05	7.97	59.1	4.95
72704	160000	24.09	8.14	81.9	6.85	24.22	7.98	60.7	5.07
72704	170000	24.20	8.18	82.9	6.92	24.34	8.02	61.7	5.14
72704	180000	24.29	8.20	86.0	7.17	24.41	8.05	59.0	4.91
72704	190000	24.41	8.23	87.9	7.31	24.62	8.12	66.1	5.48
72704	200000	24.45	8.26	89.0	7.39	24.66	8.14	64.8	5.37
72704	210000	24.46	8.27	89.6	7.44	24.58	8.07	63.8	5.29
72704	220000	24.42	8.25	88.7	7.37	24.52	8.09	63.5	5.27
72704	230000	24.50	8.25	88.2	7.32	24.45	8.08	63.8	5.31
72804	0	24.54	8.24	88.5	7.34	24.40	8.10	63.7	5.31
72804	10000	24.50	8.22	88.4	7.33	24.33	8.08	60.6	5.05
72804	20000	24.42	8.21	87.5	7.27	24.26	8.02	59.3	4.95
72804	30000	24.34	8.20	86.3	7.18	24.15	7.98	58.0	4.85
72804	40000	24.23	8.18	85.7	7.15	24.04	7.94	58.4	4.90
72804	50000	24.09	8.15	84.8	7.09	23.95	7.96	57.8	4.85
72804	60000	23.87	8.11	84.2	7.07	23.81	7.92	56.5	4.76
72804	70000	23.69	8.09	82.0	6.91	23.65	7.90	62.8	5.31
72804	80000	23.60	8.08	80.4	6.78	23.53	7.87	57.2	4.84
72804	90000	23.55	8.07	79.3	6.70	23.47	7.89	56.6	4.79
72804	100000	23.56	8.08	80.4	6.79	23.50	7.92	55.5	4.70
72804	110000	23.67	8.09	82.9	6.99	23.64	7.94	59.6	5.03
72804	120000	23.85	8.10	83.8	7.04				
72804	140000	24.12	8.06	85.8	7.05	24.26	7.95	97.2	7.95
72804	150000	24.30	8.10	91.1	7.46	24.47	7.98	99.6	8.12
72804	160000	24.41	8.13	93.5	7.64	24.66	8.03	99.7	8.09
72804	170000	24.55	8.16	94.7	7.71	24.81	8.06	101.6	8.23
72804	180000	24.61	8.19	93.1	7.58	24.82	8.07	101.5	8.22
72804	190000	24.61	8.21	96.1	7.82	24.79	8.07	101.3	8.20
72804	200000	24.54	8.22	95.5	7.79	24.77	8.05	99.8	8.09
72804	210000	24.47	8.22	96.0	7.83	24.71	8.05	99.5	8.08
72804	220000	24.42	8.20	93.8	7.66	24.63	8.03	98.2	7.98
72804	230000	24.40	8.19	93.2	7.62	24.51	8.02	97.3	7.93
72904	0	24.36	8.19	94.1	7.69	24.42	8.00	96.4	7.86
72904	10000	24.34	8.20	92.4	7.56	24.33	8.00	97.8	7.99

72904	20000	24.32	8.18	93.6	7.66	24.27	7.98	96.4	7.89
72904	30000	24.27	8.17	90.7	7.43	24.17	7.98	95.7	7.85
72904	40000	24.22	8.15	90.3	7.40	24.06	7.95	91.8	7.54
72904	50000	24.14	8.14	90.3	7.42	23.94	7.95	90.1	7.42
72904	60000	24.05	8.11	90.8	7.46	23.77	7.92	89.6	7.40
72904	70000	23.94	8.09	85.5	7.05	23.62	7.91	88.6	7.34
72904	80000	23.82	8.07	86.7	7.16	23.54	7.90	87.3	7.24
72904	90000	23.71	8.05	85.1	7.04	23.52	7.91	87.9	7.29
72904	100000	23.63	8.04	85.5	7.09	23.55	7.92	87.6	7.26
72904	110000	23.60	8.05	86.8	7.20	23.59	7.91	87.3	7.23
72904	120000	23.58	8.06	86.3	7.16	23.61	7.91	88.7	7.35
72904	130000	23.62	8.05	74.2	6.15	23.62	7.91	88.7	7.34
72904	140000	23.63	8.05	83.1	6.89	23.65	7.90	88.4	7.32
72904	150000	23.62	8.05	86.1	7.14	23.62	7.91	88.8	7.36
72904	160000	23.64	8.06	86.3	7.15	23.68	7.91	89.6	7.41
72904	170000	23.67	8.10	88.8	7.36	23.76	7.95	92.1	7.61
72904	180000	23.70	8.11	90.4	7.48	23.85	7.96	92.2	7.60
72904	190000	23.70	8.13	90.8	7.52	23.89	7.97	92.6	7.63
72904	200000	23.68	8.14	91.3	7.56	23.88	7.97	92.5	7.63
72904	210000	23.64	8.14	91.6	7.59	23.80	7.97	92.5	7.64
72904	220000	23.58	8.13	91.0	7.55	23.73	7.95	91.4	7.55
72904	230000	23.55	8.13	89.5	7.43	23.66	7.95	90.9	7.52
73004	0	23.54	8.13	89.9	7.46	23.57	7.93	89.4	7.41
73004	10000	23.51	8.13	89.6	7.45	23.51	7.93	88.7	7.36
73004	20000	23.51	8.13	88.5	7.35	23.42	7.92	87.9	7.31
73004	30000	23.48	8.11	86.9	7.22	23.34	7.90	86.8	7.23
73004	40000	23.38	8.09	86.3	7.19	23.21	7.88	85.7	7.15
73004	50000	23.20	8.06	84.4	7.06	23.06	7.87	84.8	7.10
73004	60000	22.98	8.03	80.4	6.75	22.92	7.84	83.0	6.96
73004	70000	22.80	8.01	80.9	6.81	22.77	7.83	81.9	6.89
73004	80000	22.67	7.99	80.2	6.77	22.67	7.82	81.2	6.85
73004	90000	22.63	7.98	80.4	6.79	22.68	7.84	81.0	6.82
73004	100000	22.68	7.98	80.6	6.80	22.80	7.84	82.3	6.92
73004	110000	22.82	8.00	81.7	6.88	22.94	7.84	82.1	6.88
73004	120000	23.03	8.01	83.7	7.02	23.15	7.85	84.2	7.04
73004	130000	23.23	8.03	84.2	7.03	23.42	7.88	86.9	7.23
73004	140000	23.48	8.06	87.4	7.26	23.67	7.90	89.1	7.37
73004	150000	23.58	8.09	89.0	7.39	23.80	7.93	91.1	7.52
73004	160000	23.67	8.12	91.0	7.54	23.89	7.96	93.0	7.66
73004	170000	23.73	8.15	92.9	7.68	24.04	7.98	94.6	7.77
73004	180000	23.87	8.18	93.6	7.72	24.12	7.99	95.7	7.85
73004	190000	23.91	8.19	94.9	7.82	24.17	8.01	97.0	7.95
73004	200000	23.91	8.19	94.0	7.75	24.11	8.02	97.4	7.99
73004	210000	23.87	8.18	93.3	7.70	24.05	8.01	96.3	7.91
73004	220000	23.89	8.16	93.5	7.71	24.03	7.99	95.7	7.86
73004	230000	23.88	8.16	92.3	7.62	23.97	7.98	94.8	7.80
73104	0	23.89	8.16	90.9	7.50	23.92	7.96	91.9	7.57
73104	10000	23.86	8.15	91.7	7.57	23.88	7.95	90.9	7.49
73104	20000	23.90	8.13	90.0	7.43	23.83	7.93	90.0	7.42
73104	30000	23.90	8.12	87.7	7.23	23.79	7.92	89.0	7.34
73104	40000	23.87	8.09	87.8	7.25	23.73	7.91	87.3	7.22
73104	50000	23.79	8.06	85.9	7.10	23.65	7.89	85.6	7.08
73104	60000	23.66	8.04	83.2	6.90	23.54	7.87	85.7	7.11
73104	70000	23.51	8.02	82.6	6.87	23.45	7.85	85.1	7.07
73104	80000	23.43	8.00	82.4	6.85	23.36	7.84	84.7	7.05
73104	90000	23.33	7.99	80.5	6.71	23.27	7.82	83.1	6.93

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73104	100000	23.26	7.99	81.0	6.76	23.18	7.82	81.9	6.84
73104	110000	23.20	7.99	80.3	6.71	23.18	7.82	83.0	6.93
73104	120000	23.23	7.99	82.0	6.85	23.25	7.84	83.0	6.92
73104	130000	23.34	8.01	81.6	6.80	23.40	7.86	84.6	7.03
73104	140000	23.46	8.03	84.2	7.00	23.52	7.87	85.7	7.11
73104	150000	23.60	8.04	84.6	7.01	23.68	7.89	87.1	7.21
73104	160000	23.79	8.07	86.9	7.18	23.88	7.92	89.3	7.36
73104	170000	23.96	8.11	89.3	7.36	24.08	7.94	90.7	7.45
73104	180000	24.08	8.15	90.3	7.42	24.17	7.97	92.8	7.61
73104	190000	24.08	8.16	91.3	7.50	24.22	8.00	94.1	7.70
73104	200000	24.06	8.18	92.0	7.56	24.17	8.00	93.8	7.68
73104	210000	24.03	8.16	90.7	7.46	24.12	7.99	92.3	7.57
73104	220000	24.01	8.14	90.1	7.41	24.06	8.03	90.6	7.44
73104	230000	24.03	8.14	89.0	7.33	24.01	7.96	90.0	7.40
80104	0	24.06	8.15	88.4	7.27	23.98	7.96	90.0	7.40
80104	10000	24.05	8.14	88.7	7.30	23.96	7.94	88.9	7.31
80104	20000	23.99	8.13	87.5	7.20	23.88	7.97	87.1	7.17
80104	30000	23.93	8.12	86.9	7.16	23.82	7.93	86.8	7.16
80104	40000	23.85	8.11	85.5	7.06	23.73	7.90	85.0	7.03
80104	50000	23.77	8.08	84.2	6.96	23.61	7.89	84.2	6.98
80104	60000	23.61	8.06	83.4	6.91	23.48	7.87	83.1	6.90
80104	70000	23.46	8.03	81.2	6.76	23.38	7.84	81.9	6.81
80104	80000	23.34	8.01	80.1	6.68	23.29	7.83	80.5	6.71
80104	90000	23.29	8.00	79.9	6.67	23.31	7.84	81.2	6.76
80104	100000	23.31	8.00	79.2	6.61	23.37	7.84	80.0	6.66
80104	110000	23.40	8.01	80.8	6.72	23.47	7.84	81.0	6.73
80104	120000	23.57	8.02	81.6	6.77	23.65	7.86	82.1	6.80
80104	130000	23.83	8.04	83.1	6.86	23.90	7.88	83.3	6.86
80104	140000	24.02	8.06	85.2	7.01	24.12	7.91	85.9	7.04
80104	150000	24.11	8.08	86.4	7.10	24.38	7.94	88.2	7.20
80104	160000	24.34	8.12	88.6	7.25	24.54	7.97	90.0	7.32
80104	170000	24.46	8.14	90.2	7.36	24.62	7.98	89.7	7.29
80104	180000	24.54	8.16	92.0	7.50	24.70	8.02	91.9	7.46
80104	190000	24.56	8.17	91.9	7.49	24.80	8.05	93.4	7.56
80104	200000	24.57	8.18	93.5	7.61	24.81	8.11	93.5	7.57
80104	210000	24.55	8.17	92.2	7.52	24.74	8.07	92.5	7.50
80104	220000	24.49	8.17	90.4	7.38	24.68	8.04	91.7	7.44
80104	230000	24.46	8.14	89.2	7.28	24.65	8.01	90.9	7.38
80204	0	24.48	8.14	89.4	7.30	24.59	7.99	88.2	7.18
80204	10000	24.52	8.14	90.2	7.36	24.53	7.99	87.2	7.10
80204	20000	24.54	8.13	89.5	7.29	24.49	7.99	86.7	7.06
80204	30000	24.54	8.12	88.6	7.22	24.45	7.94	85.5	6.97
80204	40000	24.51	8.10	86.6	7.06	24.38	7.91	84.2	6.87
80204	50000	24.44	8.08	85.5	6.98	24.27	7.89	82.8	6.78
80204	60000	24.33	8.05	83.0	6.79	24.16	7.89	82.7	6.78
80204	70000	24.19	8.03	81.2	6.66	24.07	7.87	81.5	6.69
80204	80000	24.09	8.01	81.7	6.72	24.02	7.86	80.8	6.64
80204	90000	24.04	8.00	80.4	6.61	24.05	7.85	80.3	6.60
80204	100000	24.11	8.00	80.5	6.61	24.20	7.85	80.7	6.61

** Monitor removed for 2004 monitoring season on 8/02/04
due to maintenance in the tailrace.

Appendix B

Calibration Data

Field Notes for Datasonde Deployment

Date/Time: May 28, 2004 10:00 Analyst: HR

Location: Grand Rapids - Headwater Datasonde Serial #: 3768|

Calibration Information Datasonde Battery [volts]: 12.5 (New)

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.35	7.00
10.00 Std	9.95	10.00

> New ph Ref. Sol. on 5/24/04

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.246	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.28"Hg, 743.5 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	108.3%	100.0%
mg/L D.O.	10.20 mg/L	9.46 mg/L
Temp – °C	16.97°C	16.95°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	94.8%	96.7%
mg/L D.O.	9.46 mg/L	9.66 mg/L
Temp – °C	16.5°C	15.5°C

Cal. elev @ 9

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	87.9%	87.0%	
mg/L D.O.	9.04 mg/L	9.14 mg/L	Deploy
Temp – °C	13.06°C	13.1°C	Test ran off Bridge

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube - outside - 18 ft depth

Time	10:55
% Saturation	87.9%
mg/L D.O.	9.21 mg/L
Temp – °C	13.2°C

Check Status
Battery Life @ Start: 100%
Battery Life @ End: 94% } OK

Notes: Partly Cloudy, No wind, 50°F. Test program GRHT0528.txt
* Shortened cable by 18", Datasonde was on bottom
Circulator test => ok

Field Notes for Datasonde Deployment

Date/Time: May 28, 2004 11:15 Analyst: HP

Location: Grand Rapids - Tailwater Datasonde Serial #: 37679

Calibration Information Datasonde Battery [volts]: 12.5 v (New)

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.82	7.00
10.00 Std	10.09	10.00

New ph Ref. Sol. on 5/24/04

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.293	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.24 "Hg, 742 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	104.9%	100.0%
mg/L D.O.	9.81 mg/L	9.39 mg/L
Temp – °C	17.16°C	17.16°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	94.3%	96.7%
mg/L D.O.	8.32 mg/L	8.53 mg/L
Temp – °C	21.6°C	21.6°C

Cal elev. @ 9

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	87.6%	90.9%	
mg/L D.O.	8.94 mg/L	9.36 mg/L	
Temp – °C	13.35°C	13.5°C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.	Deploy			
Temp – °C				

YSI Reading at Tube

Time	12:05
% Saturation	90.9%
mg/L D.O.	9.36 mg/L
Temp – °C	13.5°C

Check Status
Battery Life @ Start: 100.0%
Battery Life @ End: 94%
OK

Notes: Cloudy, No wind, 54°C
Test program GRTT0528.txt
Circulator test ⇒ OK
Cable length good

Field Notes for Datasonde Deployment

Date/Time: June 7, 2004 11:05 Analyst: HR

Location: Grand Rapids - Headwater Datasonde Serial #: 364464

Calibration Information Datasonde Battery [volts]: 5.4 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.26	7.00
10.00 Std	9.96	10.00

New ph Ref. Sol. on 6/3/04

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.289	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.10" Hg, 739 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	110.4%	100.0%
mg/L D.O.	8.95 mg/L	8.05 mg/L
Temp – °C	24.78°C	24.88°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	92.9%	96.7%
mg/L D.O.	7.41 mg/L	7.71 mg/L
Temp – °C	26.9°C	26.9°C

New cap memb. on 6/3/04

Cal. elev. @ 9

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	91.8%	93.6%	
mg/L D.O.	8.39 mg/L	8.81 mg/L	Deploy
Temp – °C	18.33°C	18.4°C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube - outside tube

Time	12:00
% Saturation	98.1%
mg/L D.O.	9.26 mg/L
Temp – °C	18.5°C

Check Status

Battery Life @ Start: 62% > OK

Battery Life @ End: 81%

Notes: partly cloudy, 72°F, moderate winds

Test program named GRHT0607.txt

Circulator test =>

Field Notes for Datasonde Deployment

Date/Time: June 7, 2004 9:30 Analyst: TP

Location: Grand Rapids Tailwater Datasonde Serial #: 37680

Calibration Information Datasonde Battery [volts]: 12.3 V (New)

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.19	7.00
10.00 Std	10.01	10.00

New ph Ref. Sol. on 6/1/04

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.279	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.05" Hg, 738 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	113.6%	100.0%
mg/L D.O.	9.46 mg/L	8.31 mg/L
Temp – °C	23.08 °C	23.10 °C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	99.9%	96.6%
mg/L D.O.	8.20 mg/L	7.93 mg/L
Temp – °C	25.4 °C	25.4 °C

New cap memb. on 6/3/04
Cal. elev. @ 9

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	94.9% 90.1%	94.9%	
mg/L D.O.	8.10 8.32 mg/L	9.10 mg/L	> recalibrate
Temp – °C	17.75 °C	17.9 °C	and retest

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	91.5%	100.0%	91.4%	94.5%
mg/L D.O.	7.58 mg/L	8.27 mg/L	8.43 mg/L	8.94 mg/L
Temp – °C	23.32 °C	23.33 °C	17.80 °C	17.90

High current in tailwater. 2nd test ran at a greater Depth to keep Datasonde from moving above water line

Deployed

YSI Reading at Tube

Time	10:45
% Saturation	94.8%
mg/L D.O.	8.98 mg/L
Temp – °C	17.7 °C

Check Status

Battery Life @ Start: 100%

Battery Life @ End: 94 %

Notes: partly cloudy, 73°, light wind

Test file named GRTT0607.txt

Circulator Test => Does not work

clean spinner

Field Notes for Datasonde Post Calibration

Date/Time: June 7, 2004 Analyst: HP

Location: Grand - Headwater Datasonde Serial #: 37681

Ending Datasonde Battery [volts]: 12.04

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.25
10.00 Std	10.15

Conductivity (mS/cm) 0.284 Std 0.284 Reads

Zero Cond. Reads
0.0000

Barometric Pressure (mm Hg) 29.10"Hg, 739 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	102.7%	100.1%
mg/L D.O.	~~7.89 mg/L~~	8.17 mg/L
Temp – °C	8.43 mg/L	24.08
	24.07°C	

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	
Temp – °C	

Notes:

Setup for D.O. calibration w/ tap water, then download file named GRH0607.txt, then read other parameters. low D.O. value on 06/07/04 @ 10:00 w/ 7.54 mg/L and 81.4% @ 17.93°C. pH value range 7.51 to 7.71 Circulator test ⇒ works fine

Field Notes for Datasonde Post Calibration

Date/Time: 6 June 7, 2004 10:00 Analyst: HR

Location: Grand Rapids Tail Datasonde Serial #: 37679

Ending Datasonde Battery [volts]: 12.0V

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.41
10.00 Std	10.32

Zero Cond. Reads
0.0000

Conductivity (mS/cm) 0.284 Std 0.282 Reads

Barometric Pressure (mm Hg) 29.05" Hg, 738 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	96.2%	100.0 %
mg/L D.O.	7.98 mg/L	8.25 mg/L
Temp – °C	23.47	23.49°C

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	
Temp – °C	

Notes:

Setup for D.O. calibration with tap water. Download file named GRT06007.txt, then calibrated D.O. and read other parameters. Low D.O reading on 06/06/04 @ 23:00, 7.79 mg/L @ 84.0% @ 17.83°. ph range = 7.64 to 7.90 circulator works not at all. Remove spinner and clean

Field Notes for Datasonde Deployment

Date/Time: June 16, 2004 8:45 Analyst: MLM

Location: Grand Rapids - Headwater Datasonde Serial #: 37681

Calibration Information Datasonde Battery [volts]: 12.0

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.35	7.01
10.00 Std	9.93	10.03

at 22°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.283	0.284	Before .0000 After .0000

Barometric Pressure (mm Hg) 743.5

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	99.4	100.0
mg/L D.O.	8.35	8.45
Temp – °C	22.55	22.58

YSI calibration (See field notes for YSI Model 95 calibration information)

	Before Calibration	After Calibration
% Saturation	~~103.8~~ 117.1	96.7
mg/L D.O.	10.38	8.58
Temp – °C	21.3	21.3

Cal. elev. 900'

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	87.8	79.9	
mg/L D.O.	7.92	7.59	ok
Temp – °C	19.26	19.3	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube

Time	9:15
% Saturation	79.9
mg/L D.O.	7.59
Temp – °C	19.3

Check Status

Battery Life @ Start: 100 %

Battery Life @ End: 97 %

Notes: Weather: 65° +Sunny - Winds 10 MPH (Beautiful morning)
test: GRHT0616.txt: ok
circulator: ok
End - 6/25 - 10000

Field Notes for Datasonde Deployment

Date/Time: June 16, 2004 10:10 Analyst: MLM

Location: Grand Rapids - Tailwaters Datasonde Serial #: 37679

Calibration Information Datasonde Battery (volts): 11.8

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.38	7.01
10.00 Std	9.99	10.03

at 22°C

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.281	0.284	Before .0000 After .0000

Barometric Pressure (mm Hg) 744

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	98.9	100.0
mg/L D.O.	8.47	8.63
Temp – °C	21.49	21.50

YSI calibration (See field notes for YSI Model 95 calibration information)

	Before Calibration	After Calibration
% Saturation	85.7	96.8
mg/L D.O.	7.44	8.39
Temp – °C	22.4	22.4

cal. elev. : 900'

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	90.7	91.3	
mg/L D.O.	8.17	8.36	- ok
Temp – °C	19.38	19.5	

100100
End #'s
92.7
8.30
19.28

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube

Time	9:40
% Saturation	91.3
mg/L D.O.	8.36
Temp – °C	19.5

Check Status

Battery Life @ Start: 100 %0

Battery Life @ End: 97 %0

Scans
14193
13912

Notes: Weather: Sunny +70 (Beautiful day.)

Test: GRTT0616.txt = ok

circulator: working very slowly - poor

End - 6/25 - 170000

Field Notes for Datasonde Post Calibration

Date/Time: 6/16/04 9:40 Analyst: MLM

Location: Grand Rapids-Hwd Datasonde Serial #: 36464

Ending Datasonde Battery [volts]: 4.7

Calibration Information

* Started at 5.0

pH (s.u.)	Reads
7.00 Std	6.96
10.00 Std	9.99

Conductivity (mS/cm) 0.284 Std 0.316 Reads

Barometric Pressure (mm Hg) 743

Dissolved Oxygen	before cal	after cal
% Saturation	99.1	100.0
mg/L D.O.	8.54	8.69
Temp – °C	21.21	21.22

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

Non-Compliance for downstream only

File: GRH0616.txt

D.O.: (<5.00)

PH: (<6.00 or >9.00)

Circulator: ok

Lots of "Power Loss + Late Proba Turn Ons"

* Very little data after 6/11/04 - 140000

Field Notes for Datasonde Post Calibration

Date/Time: 6/16/04 11:05 Analyst: MLM

Location Grand Rapids. Tail Datasonde Serial #: 37680

Ending Datasonde Battery [volts]: 12.0

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.22
10.00 Std	10.23

Conductivity (mS/cm) 0.284 Std 0.287 Reads

Barometric Pressure (mm Hg) 744

Dissolved Oxygen	before cal	after cal
% Saturation	97.4	100.1
mg/L D.O.	8.19	8.48
Temp – °C	22.44	22.51

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

F:\c: GRT0616.txt : oK

D.O.: (<5.00) : oK

PH : (<6.00 or >9.00) : oK

Circulator: Not Working

Was In TTY Mode - Took out of TTY mode to Post-Cal.

Internal Time difference-37679 + 37680 @ 5-6 minutes. Missed 10000 reading cause of time difference.

*

Field Notes for Datasonde Deployment

Date/Time: June 24, 2004 11:05 Analyst: JD

Location: @ Grand Rapids Headwater Datasonde Serial #: 36467

Calibration Information Datasonde Battery [volts]: 6.24 (New)

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	5.12	7.00
10.00 Std	10.15	10.00

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.284	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.34" Hg, 745 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	91.3%	100.0%
mg/L D.O.	8.36 mg/L	9.34 mg/L
Temp – °C	17.70°C	17.68°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration	
% Saturation	98.7%	96.7%	Cal. elev @ 9
mg/L D.O.	9.50 mg/L	9.32 mg/L	
Temp – °C	17.2°C	17.2°C	New cap memb. on 6/23/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	91.2%	90.7%	Ran off Bride
mg/L D.O.	8.30 mg/L	8.38 mg/L	
Temp – °C	18.96	19.0°C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.	Deploy			
Temp – °C				

YSI Reading at Tube – outside @ depth of tube (close to bottom)

Time	12:00
% Saturation	90.9%
mg/L D.O.	8.41 mg/L
Temp – °C	19.0°C

Check Status

Battery Life @ Start: 100% } OK

Battery Life @ End: 67%

Notes: Partly Cloudy, moderate winds, 57°F

test program named GRHT0624.txt

Circulator test => OK

Field Notes for Datasonde Deployment

Date/Time: June 24, 2004 12:15 Analyst: TR

Location: Grand Rapids Tailwater Datasonde Serial #: 37680

Calibration Information Datasonde Battery (volts): 11.9 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.27	7.00
10.00 Std	10.03	10.00

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.280	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.36" Hg, 745.5 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	111.1%	100.0%
mg/L D.O.	10.40 mg/L	9.38 mg/L
Temp – °C	17.45 °C	17.46 °C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration	
% Saturation	97.3%	96.7%	Cal. elev. @ 9
mg/L D.O.	9.07 mg/L	9.01 mg/L	
Temp – °C	18.7 °C	18.7 °C	New cap. memb. on 6/23/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	85.6%	89.4%	
mg/L D.O.	7.75 mg/L	8.20 mg/L	In tailrace
Temp – °C	19.22 °C	19.3 °C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.	Deploy			
Temp – °C				

YSI Reading at Tube - inside tube

Time	13:10
% Saturation	89.7%
mg/L D.O.	8.24 mg/L
Temp – °C	19.3

Check Status
Battery Life @ Start: 98% > ok
Battery Life @ End: 93%

Notes: Mostly cloudy, moderate winds, 56°F
test program named GRTT0624.txt

Circulator test => works good.

Field Notes for Datasonde Post Calibration

Date/Time: June 24, 2004 11:30 Analyst: HP

Location: Grand Rapids Head Datasonde Serial #: 37681

Ending Datasonde Battery [volts]: 11.8 V

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.05
10.00 Std	10.18

Conductivity (mS/cm) 0.284 Std 0.287 Reads

Zero Cond. Reads: 0.000

Barometric Pressure (mm Hg) 745 mm Hg, 29.34" Hg

Dissolved Oxygen	before cal	after cal
% Saturation	95.8%	99.9%
mg/L D.O.	8.86 mg/L	9.13 mg/L
Temp – °C	18.12 °C	18.09 °C

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	X
Temp – °C	X

Notes:

Setup for D.O. Calibration w/ tap water, Download file named GRH0624.txt, then calibrate D.O. and read other parameters.

D.O. low value = 6.66 mg/L @ 74.1% @ 19.46 on 6/23/04 @ 03:00

ph range = 7.55 to 7.87 → OK

Circulator test ⇒ works good

Field Notes for Datasonde Post Calibration

Date/Time: June 24, 2004 Analyst: JR

Location: Grand Rapids Tailwater Datasonde Serial #: 37679

Ending Datasonde Battery [volts]: 11.94

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.19
10.00 Std	10.20

Conductivity (mS/cm) 0.285 Std 0.284 Reads

Zero Cond. Reads 0.0000

Barometric Pressure (mm Hg) 29.36" Hg, 745.5 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	94.7%	100.1%
mg/L D.O.	8.91 mg/L	9.41 mg/L
Temp – °C	17.36 °C	17.34 °C

YSI calibration (See field notes for — for calibration info.)

% Saturation	
mg/L D.O.	X
Temp – °C	

Notes:

Setup for D.O. calibration w/ tap water, then download file named GRT0624.EXE, Calibrate D.O. and read other parameters

Low D.O. reading ⊛ = 6.19 @ 85.1% @ 19.21°C on 6/22/04 @ 10:00

pH range = 7.64 to 8.00

Circulator test ⇒ does not work needs to be cleaned.

⊛ D.O. went From 7.69 mg/L to 6.19 mg/L to 7.05 mg/L. Only [illegible] that are 7 or above

Field Notes for Datasonde Deployment

Date/Time: July 2, 2004 11:45 Analyst: HR

Location: Grand Rapids - Headwater Datasonde Serial #: 37681

Calibration Information Datasonde Battery [volts]: 11.8 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.37	7.00
10.00 Std	9.99	10.00

New ph ref. Sol. on 7/1/04

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.286 Std	0.285	0.286	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.42" Hg, 747.5 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration	YSI 55 Before	YSI 55 After
% Saturation	128.4%	100.0%	97.6%	96.7%
mg/L D.O.	10.74 mg/L	8.38 mg/L	8.25 mg/L	8.17 mg/L
Temp – °C	23.25	23.25°C	23.8°C	23.8°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	95.5%	96.6%
mg/L D.O.	7.99 mg/L	8.08 mg/L
Temp – °C	24.4°C	24.4°C

New memb. on 6/23/04
Cal. elev. @ 9

Test Program Readings

	Datasonde	YSI Meter (Must be within 0.5 mg/L D.O.)
% Saturation	96.9%	106.0%
mg/L D.O.	8.21 mg/L	9.30 mg/L
Temp – °C	21.87°C	21.9°C

Ran outside tube, off bridge

Re-calibration required if outside 0.5 mg/l limit → recalibrate - also calibrate YSI 55 meter

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	93.6%	100.0%	103.5%	104.7%
mg/L D.O.	7.88 mg/L	8.42 mg/L	8.89	9.16 mg/L
Temp – °C	23.05	23.04°C	22.04	22.0

Deploy

YSI Reading at Tube - at bottom of tube depth, outside tube.

Time	12:45
% Saturation	107.3%
mg/L D.O.	9.38 mg/L
Temp – °C	22.0°C

Check Status
Battery Life @ Start: 96% > ok
Battery Life @ End: 90%

Notes: partly cloudy, light wind, 66°F
Test program named GRHT0702.txt

Circulator works good.

Field Notes for Datasonde Deployment

Date/Time: July 2, 2004 13:20 Analyst: HR

Location: Grand Rapids - Tailwater Datasonde Serial #: 37679

Calibration Information Datasonde Battery [volts]: 11.9 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.22	7.00
10.00 Std	9.89	10.00

New ph Ref. Solution on 7/1/04

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.285 Std	0.288	0.285	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.42" Hg, 747.5 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	130.5%	100.0%
mg/L D.O.	10.88 mg/L	8.38 mg/L
Temp – °C	23.26 °C	23.25 °C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	96.9%	96.7%
mg/L D.O.	7.80 mg/L	7.79 mg/L
Temp – °C	26.4 °C	26.4 °C

Cal. elev @ 9

New memb. cap on 6/23/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	107.4%	107.7%	
mg/L D.O.	9.22 mg/L	9.39 mg/L	Deploy
Temp – °C	22.02	22.1 °C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube - outside tube @ Datasonde depth

Time	14:20
% Saturation	102.7%
mg/L D.O.	9.03 mg/L
Temp – °C	22.0 °C

Check Status

Battery Life @ Start: 96%

Battery Life @ End: 90%

Notes: partly cloudy, light wind, 70°F

Test file named GRTT0702.txt

Circulator works but turns slowly

Field Notes for Datasonde Post Calibration

Date/Time: July 2, 2004 12:05 Analyst: HR

Location: Grand Rapids - Headwaters Datasonde Serial #: 36467

Ending Datasonde Battery [volts]: 5.6 V

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.45
10.00 Std	10.42

Zero Cond. Reads

Conductivity (mS/cm) 0.284 Std 0.281 Reads 0.0000

Barometric Pressure (mm Hg) 29.42 "Hg, 747.5 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	98.5%	100.0%
mg/L D.O.	8.29 mg/L	8.45 mg/L
Temp – °C	22.91 °C	22.89 °C

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	X
Temp – °C	X

Notes:

Setup for D.O. calibration w/ tap water. Download file named GRH0708.txt, Calibrate D.O. and read other parameters. low D.O. value: 8.02 mg/L @ 88.1% @ 18.90 °C, on 6/24/04 12:00 ph range: 7.88 to 8.75

Circulator works good.

Field Notes for Datasonde Post Calibration

Date/Time: July 2, 2004 13:45 Analyst: HA

Location: Grand Rapids Tail Datasonde Serial #: 37680

Ending Datasonde Battery [volts]: 11.8V

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.12
10.00 Std	10.09

Conductivity (mS/cm) 0.285 Std 0.281 Reads Zero Cond.

Barometric Pressure (mm Hg) 747.5mmHg

Dissolved Oxygen	before cal	after cal
% Saturation	86.4%	100.0%
mg/L D.O.	7.26 mg/L	8.43 mg/L
Temp – °C	23.02	23.01

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	
Temp – °C	

Notes:

Setup for D.O. Calibration, with tap water. Download file named GRT0702.txt, then read other parameters.

low D.O. reading: 6.53 mg/L, 72.4% @ 19.39°C on 6/29/04 11:00

pH values: high 7's to low 8's

circulator ⇒ works good

Field Notes for Datasonde Deployment

Date/Time: July 12, 2004 - [redacted] 9:40 Analyst: MLK

Location: Grand Rapids - [redacted] Headwaters Datasonde Serial #: 36468

Calibration Information Datasonde Battery [volts]: 6.0

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.75	7.01
10.00 Std	9.96	10.02

at 22°c

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.288	0.284	Before .0000 After .0000

Barometric Pressure (mm Hg) 740

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	137.4	100.0
mg/L D.O.	11.72	8.48
Temp – °C	22.07	22.62

YSI calibration (See field notes for YSI Model 95 calibration information)

	Before Calibration	After Calibration
% Saturation	100.5	96.6
mg/L D.O.	8.57	8.23
Temp – °C	23.3	23.4

Cal. elev. = 900'

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.) End #'s
% Saturation	87.2	89.3	
mg/L D.O.	7.71	8.10	- ok
Temp – °C	20.05	20.1	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube

Time	10:05
% Saturation	89.3
mg/L D.O.	8.10
Temp – °C	20.1

Check Status

Battery Life @ Start: 98%

Battery Life @ End: 75%

Notes: Weather: Sunny + beautiful - 70° - No Wind

circulator: ok

* Test File: GRTT712.txt: ok - Correct For Head File Test

End Date: 0722 - 170000

Field Notes for Datasonde Deployment

Date/Time: July 12, 2004 10:55 Analyst: MLM

Location: Grand Rapids - [redacted] Tailwater Datasonde Serial #: 37680

Calibration Information Datasonde Battery [volts]: 11.7

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	6.34	7.02
10.00 Std	9.99	10.03

at 23°c

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.287	0.284	Before .0000 After .0000

Barometric Pressure (mm Hg) 740

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	128.5	100.0
mg/L D.O.	10.87	8.35
Temp – °C	22.88	22.99

YSI calibration (See field notes for YSI Model 95 calibration information)

	Before Calibration	After Calibration
% Saturation	92.8	96.7
mg/L D.O.	7.38	7.69
Temp – °C	21.1	21.1

cal. elev. - 900'

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	82.7	85.2	
mg/L D.O.	7.29	7.66	- ok
Temp – °C	20.14	20.2	

End #'s

68.4	79.4
6.09	7.11
20.17	19.89
110000	100000

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

YSI Reading at Tube

Time	11:15
% Saturation	85.2
mg/L D.O.	7.66
Temp – °C	20.2

Check Status
Battery Life @ Start: 94 %
Battery Life @ End: 91 %

Notes: Weather: Sunny + Warm - slight wind
Circulator: ok
Test File: [redacted] GRCT712.txt - ok
End Date: 0722 - 170000

* Dewater Canal - 8/1 * Grand Rapids Correct Tail Test

Field Notes for Datasonde Post Calibration

Date/Time: July 12, 2004 Analyst: MLM

Location: Grand - Headwaters Datasonde Serial #: 37681

Ending Datasonde Battery [volts]: 11.5

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.35
10.00 Std	10.34

Conductivity (mS/cm) 0.284 Std 0.290 Reads

Barometric Pressure (mm Hg) 740

Dissolved Oxygen	before cal	after cal
% Saturation	94.4	100.0
mg/L D.O.	8.01	8.39
Temp – °C	22.64	22.68

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

Circulator: ok

F:\ : GRH712.txt : ok

7/5/-070000 - Lowest D.O. : 6.53

Field Notes for Datasonde Post Calibration

Date/Time: July 12, 2004 11:40 Analyst: MLM

Location: Grand-Tailwater Datasonde Serial #: 37679

Ending Datasonde Battery [volts]: 11.6

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.61
10.00 Std	10.64

Zero

Conductivity (mS/cm) 0.284 Std 0.289 Reads .0000

Barometric Pressure (mm Hg) 740

Dissolved Oxygen	before cal	after cal
% Saturation	96.8	100.1
mg/L D.O.	7.81	8.07
Temp – °C	24.76	24.87

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

File: GRT0712.txt: ok

* Circulator: Not Working

D.O.: (<5.00): ok Low Reading - 0704. 080000 - 5.58

pH: (<6.00 or >9.00): ok Dropped from 7.30 - 5.58 - 6.6

Otherwise - all > 6.00

Field Notes for Datasonde Deployment

Date/Time: July 20, 2004 11:30 Analyst: HP

Location: Grand Rapids - Headwater Datasonde Serial #: 37679

Calibration Information Datasonde Battery [volts]: ~~6.64~~ 11.64

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.75	7.00
10.00 Std	10.06	10.00

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.283	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.84" Hg, 758 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	99.0%	100.0%
mg/L D.O.	7.97 mg/L	8.26 mg/L
Temp – °C	24.90°C	24.91°C

YSI calibration (See field notes for YSI Model 95 MEA calibration Information)

	Before Calibration	After Calibration	
% Saturation	97.6%	96.7%	Cal. elev. @ 9
mg/L D.O.	7.76 mg/L	7.69 mg/L	
Temp – °C	27.1°C	27.1°C	New cap memb. on 7/20/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	95.3%	97.7%	Ran off bridge at about
mg/L D.O.	8.05 mg/L	8.27 mg/L	4 foot depth
Temp – °C	23.60°C	23.7°C	

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.	Deploy			
Temp – °C				

YSI Reading at Tube – At tube depth - outside of tube

Time	12:40
% Saturation	98.3%
mg/L D.O.	8.31 mg/L
Temp – °C	23.8°C

Check Status
Battery Life @ Start: 93% > OK
Battery Life @ End: 89 %

Notes: Partly cloudy, No wind, 72°F

test program named GRH0720.txt

Circulator turns but slowly

Field Notes for Datasonde Deployment

Date/Time: July 20, 2004 12:50 Analyst: JP

Location: Grand Rapids - Tailwater Datasonde Serial #: 37681

Calibration Information Datasonde Battery [volts]: 11.6 V

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.04	7.00
10.00 Std	9.98	10.00

Conductivity (mS/cm)		Before Cal.	After Cal.	Zero Conductivity Calibration
0.284	Std	0.286	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.58" Hg, 757 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	92.6%	100.0%
mg/L D.O.	7.50 mg/L	8.09 mg/L
Temp – °C	25.9°C	25.9°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	96.3%	96.6%
mg/L D.O.	7.25 mg/L	7.28 mg/L
Temp – °C	30.2°C	30.2°C

Cal. elev. @ 9

New Cap. Memb. 7/20/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	94.6%	98.4%	
mg/L D.O.	7.96 mg/L	8.29 mg/L	
Temp – °C	23.87°C	23.9°C	

Ran in tailrace at about four foot depth

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	Deployed			
mg/L D.O.				
Temp – °C				

YSI Reading at Tube - at tube depth, outside of tube

Time	13:40
% Saturation	99.4%
mg/L D.O.	8.41 mg/L
Temp – °C	23.9°C

Check Status

Battery Life @ Start: 89% > ok

Battery Life @ End: 85%

Notes: Partly cloudy, little wind, 75°F

Test program named GRTT0720.txt

Circulator works great

Field Notes for Datasonde Post Calibration

Date/Time: July 20, 2004 11:50 Analyst: TP

Location: Grand Rapids Head Datasonde Serial #: 364468

Ending Datasonde Battery [volts]: Dead

Calibration Information

Cannot perform Post Calibration

pH (s.u.)	Reads
7.00 Std	
10.00 Std	

Conductivity (mS/cm) _____ Std _____ Reads _____ Zero Reads

Barometric Pressure (mm Hg) _____

Dissolved Oxygen	before cal	after cal
% Saturation		
mg/L D.O.		
Temp – °C		

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	X
Temp – °C	

Notes:

Unable to post calibrate. Datasonde must have been hit by something because cap of datasonde crooked on top and datasonde batteries are dead. Opened datasonde body and dump out about a half gallon of water. After drying for a while I was able to get the file downloaded but only has 2 hours of data before it was hit.

Field Notes for Datasonde Post Calibration

Date/Time: July 20, 2004 13:05 Analyst: HP

Location: Grand Rapids Tail Datasonde Serial #: 37680

Ending Datasonde Battery [volts]: 11.5 v

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.35
10.00 Std	10.35

Conductivity (mS/cm) 0.284 Std 0.279 Reads 0.000 Zero Reads

Barometric Pressure (mm Hg) 29.58"Hg, 757 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	96.5%	100.0%
mg/L D.O.	7.70 mg/L	8.15 mg/L
Temp – °C	25.50 °C	25.61 °C

YSI calibration (See field notes for — for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

Setup for D.O. calibration w/ tap water, download file named GRT0720.txt, then read other parameters.

low D.O. value = 6.05 mg/L 71.6% 22.34° on 7/16/04 @ 11:00

pH values = 7.95 to 8.58

Circulator works great

Field Notes for Datasonde Deployment

Date/Time: July 28, 2004, 11:25 Analyst: HP

Location: Grand Rapids Headwater Datasonde Serial #: 36467

Calibration Information Datasonde Battery [volts]: 6.14

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.61	7.00
10.00 Std	10.02	10.00

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.284 Std	0.282	0.284	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.40" Hg, 743 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	106.8%	100.0%
mg/L D.O.	8.75 mg/L	8.02 mg/L
Temp – °C	25.29°C	25.30°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	93.6%	96.7%
mg/L D.O.	7.39 mg/L	7.63 mg/L
Temp – °C	27.5°C	27.5°C

Cal. elev. @ 9

New memb. cap on 7/20/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	92.3%	95.1%	
mg/L D.O.	7.59 mg/L	8.02 mg/L	
Temp – °C	24.03°C	24.0°C	

Ran off Bridge at about four foot depth

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation				
mg/L D.O.				
Temp – °C				

Deployed

YSI Reading at Tube – outside tube @ tube end depth

Time	12:10
% Saturation	95.1%
mg/L D.O.	8.01 mg/L
Temp – °C	23.9°C

Check Status

Battery Life @ Start: 98% > OK

Battery Life @ End: 61%

Notes: Clear, moderate winds, 76°F

test file named GRHT0728.EXE

circulator works great

Datasonde setup to collect data until 17:00 on 8/6/04

Field Notes for Datasonde Deployment

Date/Time: July 28, 2004 12:25 Analyst: JP

Location: Grand Rapids Tailwater Datasonde Serial #: 37680

Calibration Information Datasonde Battery [volts]: 11.6

pH (s.u.)	Before Cal.	After Cal.
7.00 Std	7.35	7.00
10.00 Std	9.98	10.00

Conductivity (mS/cm)	Before Cal.	After Cal.	Zero Conductivity Calibration
0.286 Std	0.282	0.286	Before 0.000 After 0.000

Barometric Pressure (mm Hg) 29.50" Hg, 744 mm Hg

Dissolved Oxygen	Before Calibration	After Calibration
% Saturation	98.6%	100.0%
mg/L D.O.	8.07 mg/L	8.04 mg/L
Temp – °C	25.22°C	25.24°C

YSI calibration (See field notes for YSI Model 95 MEA calibration information)

	Before Calibration	After Calibration
% Saturation	97.6%	96.7%
mg/L D.O.	7.78 mg/L	7.71 mg/L
Temp – °C	27.0°C	27.0°C

Cal. elev. @ 9

New memb. cap on 7/20/04

Test Program Readings

	Datasonde	YSI Meter	(Must be within 0.5 mg/L D.O.)
% Saturation	90.0%	93.3%	
mg/L D.O.	7.42 mg/L	7.84 mg/L	
Temp – °C	24.0°C 23.87°C	24.0°C	

Ran in tailrace at about a four foot depth

Re-calibration required if outside 0.5 mg/l limit

	Before Cal.	After Cal.	Datasonde	YSI
% Saturation	Deployed			
mg/L D.O.				
Temp – °C				

YSI Reading at Tube - outside tube @ tube depth

Time	13:10
% Saturation	80.5%
mg/L D.O.	6.77 mg/L
Temp – °C	24.0°C

Check Status

Battery Life @ Start: 89% > OK

Battery Life @ End: 83%

Notes: Clear, moderate wind, 76°F

test program named GRTT0728.txt

Circulator test works OK (slow)

Field Notes for Datasonde Post Calibration

Date/Time: July 28, 2004 11:45 Analyst: HP

Location: Grand Rapids Head Datasonde Serial #: 37679

Ending Datasonde Battery [volts]: 11.5

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.13
10.00 Std	10.14

Conductivity (mS/cm) 0.286 Std 0.284 Reads 0.000 Zero Reads

Barometric Pressure (mm Hg) 29.40" Hg, 743 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	100.0%	100.1%
mg/L D.O.	8.33 mg/L	8.15 mg/L
Temp – °C	24.44 °C	24.46 °C

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	X
Temp – °C	X

Notes:

Setup for D.O. calibration w/ tap water, Download file named GRH0728.txt and read other parameters.

low D.O. value is 4.44 mg/L, 51.5% @ 23.08°C on 7/27/04 @ 07:00

pH looks good 7.8 to 8.2

Field Notes for Datasonde Post Calibration

Date/Time: July 28, 2004 Analyst: JP

Location: Grand Rapids Tail Datasonde Serial #: 37681

Ending Datasonde Battery [volts]: 11.5 v

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.25
10.00 Std	10.27

Conductivity (mS/cm) 0.286 Std 0.283 Reads 0.000 Zero Reads

Barometric Pressure (mm Hg) 29.50 "Hg, 744 mm Hg

Dissolved Oxygen	before cal	after cal
% Saturation	83.2%	100.1%
mg/L D.O.	6.84 mg/L	8.11 mg/L
Temp – °C	24.83 °C	24.84 °C

> High degree of bio-accumulation on probes

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	X
mg/L D.O.	
Temp – °C	

Notes:

Setup for D.O. calibration w/ tap water, download file named GRT0728.txt and then read other parameters.
low D.O. value is 6.07 mg/L, 72.1% @ 23.72 °C on 7/27/04 @ 14:00
ph range good - 7.95 to 8.25
Circulator test - works good

Field Notes for Datasonde Post Calibration

Date/Time: Aug. 2, 2004 10:30 Analyst: MLM

Location: Grand - Upstream Datasonde Serial #: 36467

Ending Datasonde Battery [volts]: 5.6

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.04
10.00 Std	10.00

Conductivity (mS/cm) 0.287 Std 0.320 Reads .0000 Zero Reads

Barometric Pressure (mm Hg) 739

Dissolved Oxygen	before cal	after cal
% Saturation	100.9	100.0
mg/L D.O.	8.03	7.90
Temp – °C	25.76	25.85

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

Sunny +80° - Slight Wind, Humid

GRA802.txt - ok

PN's - ok

DO's - Lowest 660 on 8/2 at 090000

Circulator - ok

F.T. downloaded, then deleted.

Field Notes for Datasonde Post Calibration

Date/Time: Aug. 2, 2004 11:05 Analyst: MLM

Location: Grad. Tailwater Datasonde Serial #: 37680

Ending Datasonde Battery [volts]: 11.4

Calibration Information

pH (s.u.)	Reads
7.00 Std	7.17
10.00 Std	10.13 (Jumping 10.11-10.19)

Conductivity (mS/cm) 0.287 Std 0.301 Reads .0000 Zero Reads

Barometric Pressure (mm Hg) 740

Dissolved Oxygen	before cal	after cal
% Saturation	93.4	99.9
mg/L D.O.	7.37	7.83
Temp – °C	26.28	26.35

YSI calibration (See field notes for _____ for calibration info.)

% Saturation	
mg/L D.O.	
Temp – °C	

Notes:

Sunny + 80° V. Humid - No Wind

GRT802.txt: ok

PH's = ok

DO's = Lowest - 6.15 on 7/29 at 130000

Circulator's ok

File downloaded, then deleted.

Appendix C

Documentation of Agency Consultation

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

October 20, 2004

FERC Project No. 2433

Ms. Jessica Mistak
Michigan Department of Natural Resources
Marquette State Fish Hatchery and Station
488 Cherry Creek Road
Marquette, MI 49855

Dear Ms. Mistak:

Grand Rapids Hydroelectric Project - Water Quality Monitoring Data

Wisconsin Public Service Corporation (WPSC) is pleased to submit water quality monitoring data for the 2004 monitoring year for your review and comment.

Per the water quality monitoring plan for the Grand Rapids Hydroelectric Project, dissolved oxygen (D.O.), temperature, and pH was monitored at two locations on the Menominee River. The first monitoring location was upstream of the Grand Rapids Dam and the second was in the powerhouse tailrace. The raw D.O., temperature, and pH data is enclosed for your review.

Please note that water quality monitoring was ended on August 2, 2004, due to the power canal being de-watered for maintenance purposes. The normal monitoring season is from June 1st to September 30th. There are no deviations from water quality standards. Copies of pre- and post-deployment calibration data are also attached. For consultation purposes, this information is also being provided to Mr. Mike Donofrio of the Wisconsin Department of Natural Resources (WDNR) and Mr. Larry Thompson of the U.S. Fish and Wildlife Service (FWS).

Please review the enclosed data and make any comments you may have as soon as possible, but within 30 days of this letter. Should you have any questions or concerns, please do not hesitate to call me at (920) 433-1833. Thank you for your time and consideration.

Sincerely,

Mark Metcalf

Mark W. Metcalf
Environmental Consultant
Telephone: (920) 433-1833

Enc.

cc: Mr. Shawn Puzen, WPSC - D2
Ms. Joan Johanek, WPSC – D2

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

REBECCA A. HUMPHRIES
DIRECTOR

Refer to: 4202.2.41

November 6, 2004

Mr. Mark Metcalf
Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Subject: Grand Rapids Hydroelectric Project Water Quality Monitoring FERC No. 2433

The Michigan Department of Natural Resources has reviewed the 2005 Grand Rapids Hydroelectric Project Water Quality Monitoring data. We are pleased that no deviations from water quality standards occurred during the period monitored. However, as you mentioned, water quality monitoring did not occur throughout the entire monitoring period of June 1 through September 30 because of power canal maintenance. Instead, the monitoring period ended on August 2, 2004.

In reviewing the previous water quality monitoring data from 1999, numerous gaps in the data exist owing to malfunctioning equipment. In light of this and the lack of 2004 data for the months of August and September, MDNR asks that you monitor water quality at the Grand Rapids Project during August and September 2005. It is our understanding that the next complete water quality monitoring period will take place in five years, or 2009.

If you have any questions, please contact me.

Sincerely,

Jessica Mistak

Jessica Mistak, Senior Fisheries Biologist
MDNR Marquette Fisheries Station
484 Cherry Creek Rd
Marquette, MI 49855
906-249-1611 ext 308
mistakjl@michigan.gov

cc: Mr. Larry Thompson, FWS
Mr. Mike Donofrio, WDNR
Mr. Chris Freiburger, MDNR FERC Sub-Unit

Response to Comments from the Michigan Department of Natural Resources (MDNR)

Comment: In reviewing the previous water quality monitoring data from 1999, numerous gaps in the data exist owing to malfunctioning equipment. In light of this and the lack of 2004 data for the months of August and September, MDNR asks that you monitor water quality at the Grand Rapids Project during August and September 2005. It is our understanding that the next complete water quality monitoring period will take place in five years, or 2009.

Response: Comment noted. Wisconsin Public Service Corp. will perform water quality monitoring during the months of August and September, 2005, at the Grand Rapids Hydroelectric facility as described in the Water Quality Monitoring Plan.

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

October 20, 2004

FERC Project No. 2433

Mr. Mike Donofrio
Wisconsin Department of Natural Resources
101 N. Ogden Rd.
Peshtigo, WI 54157

Dear Mr. Donofrio:

Grand Rapids Hydroelectric Project - Water Quality Monitoring Data

Wisconsin Public Service Corporation (WPSC) is pleased to submit water quality monitoring data for the 2004 monitoring year for your review and comment.

Per the water quality monitoring plan for the Grand Rapids Hydroelectric Project, dissolved oxygen (D.O.), temperature, and pH was monitored at two locations on the Menominee River. The first monitoring location was upstream of the Grand Rapids Dam and the second was in the powerhouse tailrace. The raw D.O., temperature, and pH data is enclosed for your review.

Please note that water quality monitoring was ended on August 2, 2004, due to the power canal being de-watered for maintenance purposes. The normal monitoring season is from June 1st to September 30th. There are no deviations from water quality standards. Copies of pre- and post-deployment calibration data are also attached. For consultation purposes, this information is also being provided to Ms. Jessica Mistak of the Michigan Department of Natural Resources (MDNR) and Mr. Larry Thompson of the U.S. Fish and Wildlife Service (FWS).

Please review the enclosed data and make any comments you may have as soon as possible, but within 30 days of this letter. Should you have any questions or concerns, please do not hesitate to call me at (920) 433-1833. Thank you for your time and consideration.

Sincerely,

Mark Metcalf

Mark W. Metcalf
Environmental Consultant
Telephone: (920) 433-1833

Enc.

cc: Mr. Shawn Puzen, WPSC - D2
Ms. Joan Johanek, WPSC – D2

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY 608-267-6897

November 8, 2004

Mr. Mark Metcalf
Wisconsin Public Service Corporation
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

Subject: Grand Rapids Hydroelectric Project Water Quality Monitoring FERC No. 2433

The Wisconsin Department of Natural Resources has reviewed the 2004 Grand Rapids Hydroelectric Project Water Quality Monitoring data. We are pleased that no deviations from water quality standards occurred during the period monitored. However, as you mentioned, water quality monitoring did not occur throughout the entire monitoring period of June 1 through September 30; because of power canal maintenance. Instead, the monitoring period ended on August 2, 2004.

In reviewing the previous water quality monitoring data from 1999, numerous gaps in the data exist owing to malfunctioning equipment. In light of this and the lack of 2004 data for the months of August and September, WIDNR asks that you monitor water quality at the Grand Rapids Project during August and September 2005. It is our understanding that the next complete water quality monitoring period will take place in five years, or 2009.

If you have any questions, please contact me.

Sincerely,

Michael Donofrio
Peshtigo Fisheries Supervisor
Wisconsin Department of Natural Resources
PO Box 208
Peshtigo, WI 54157
715-582-5050

cc: Mr. Larry Thompson, FWS
Ms. Jessica Mistak, MIDNR

Response to Comments from the Wisconsin Department of Natural Resources (WDNR)

Comment: In reviewing the previous water quality monitoring data from 1999, numerous gaps in the data exist owing to malfunctioning equipment. In light of this and the lack of 2004 data for the months of August and September, WIDNR asks that you monitor water quality at the Grand Rapids Project during August and September 2005. It is our understanding that the next complete water quality monitoring period will take place in five years, or 2009.

Response: Comment noted. Wisconsin Public Service Corp. will perform water quality monitoring during August and September, 2005, at the Grand Rapids Hydroelectric facility as described in the Water Quality Monitoring Plan.

Wisconsin Public Service Corporation
(a subsidiary of WPS Resources Corporation)
700 North Adams Street
P.O. Box 19002
Green Bay, WI 54307-9002

October 20, 2004

FERC Project No. 2433

Mr. Larry Thompson
U.S. Fish and Wildlife Service
2661 Scott Tower Drive
New Franken, WI 54229

Dear Mr. Thompson:

Grand Rapids Hydroelectric Project - Water Quality Monitoring Data

Wisconsin Public Service Corporation (WPSC) is pleased to submit water quality monitoring data for the 2004 monitoring year for your review and comment.

Per the water quality monitoring plan for the Grand Rapids Hydroelectric Project, dissolved oxygen (D.O.), temperature, and pH was monitored at two locations on the Menominee River. The first monitoring location was upstream of the Grand Rapids Dam and the second was in the powerhouse tailrace. The raw D.O., temperature, and pH data is enclosed for your review.

Please note that water quality monitoring was ended on August 2, 2004, due to the power canal being de-watered for maintenance purposes. The normal monitoring season is from June 1st to September 30th. There are no deviations from water quality standards. Copies of pre- and post-deployment calibration data are also attached. For consultation purposes, this information is also being provided to Ms. Jessica Mistak of the Michigan Department of Natural Resources (MDNR) and Mr. Mike Donofrio of the Wisconsin Department of Natural Resources (WDNR).

Please review the enclosed data and make any comments you may have as soon as possible, but within 30 days of this letter. Should you have any questions or concerns, please do not hesitate to call me at (920) 433-1833. Thank you for your time and consideration.

Sincerely,

Mark Metcalf

Mark W. Metcalf
Environmental Consultant
Telephone: (920) 433-1833

Enc.

cc: Mr. Shawn Puzen, WPSC - D2
Ms. Joan Johanek, WPSC – D2

The U.S. Fish and Wildlife Service (FWS) did not respond with comments