

**DARRYL M. ROBINS CONSULTING INC.**  
**CIVIL & ENVIRONMENTAL ENGINEERING**

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M09010

January 4, 2013

Mr. Troy Cameron, Assistant Public Works Manager  
The Municipality of Northern Bruce Peninsula  
56 Lindsay Road 5, RR # 2  
Lion's Head, ON  
N0H 1W0

Mr. Leo-Paul Frigault, Cluster Manager  
Ontario Clean Water Agency  
PO Box 310  
315 George Street  
Warton, Ontario  
N0H 2T0

**Re: 2012 Annual Report for Lakewood Subdivision Sewage System  
Municipality of Northern Bruce Peninsula**

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Dear Mr. Cameron & Mr. Frigault,

Darryl M. Robins Consulting Inc. (DMRC) is pleased to provide the following Annual Report for 2012. The following report outlines key elements of the sewage system and provides a brief discussion of the Consultant's observations at the site inspection. Please find attached to this report the Annual Inspection Summary from October 16, 2012 and Table No.'s 1 and 2.

The Ontario Clean Water Agency (OCWA) is the responsible authority for operation and maintenance duties of the sewage system under contract to the Municipality of Northern Bruce Peninsula (Municipality). OCWA began these duties on July 1, 2009.

**Sewage System Capacity:**

From the records provided by the Municipality and OCWA as of November 7, 2012, there are currently 37 dwellings connected to the Lakewood Subdivision Sewage System. The original Certificate of Approval specified that each dwelling would be allotted a daily sewage flow of 1,200L/day for a maximum of 48 lots; therefore, the ultimate design daily sewage flow for the sewage system is 57,600L/day. With 37 dwellings online at present, the calculated daily sewage flow should be 44,400L/day.

OCWA has been maintaining records of the readings on the elapsed hour meters of the sewage dosing pumps for the tile field (See Table 1).

During normal operation it appears that the pumps are dosing the tile field with an average volume of approximately 6,887 L/day based on the respective pumping rates determined by the pumping tests conducted by OCWA and DMRC at the site meeting of November 15, 2011. These pumping rates should be used by OCWA personnel in recording and evaluating flows at the facility. The results from the dosing pump records suggest that the actual sewage flows being received by the system are substantially less than the design and that the sewage system should have sufficient capacity for completion of Phases 1 and 2B of the subdivision. The average daily sewage flow for 2012 (6,877 L/day) is approximately 3% less than that determined for 2011 (7,116 L/day).

The maximum daily sewage flow rate experienced in 2012 was 16,757 L/d which is substantially lower than the calculated daily sewage flows of 44,400 L/d for the 37 dwellings on-line in 2012.

### **Sampling Results:**

OCWA took a sample of the sewage effluent during the 2012 annual inspection. The sample was analyzed by SGS Lakefield Research Limited and the results are shown on Table 2 (attached). The results of the Lakewood Subdivision sewage effluent sampling for the 2012 sampling event indicate that the sewage effluent is within typical values and there are no adverse results within the parameters tested to suggest unsuitable treatment for discharge to the tile fields.

The sample contained 98 mg/L of TSS which is at the high end of the typical concentration range for septic effluent. The 2012 sample contained approximately 32% more TSS than the 2011 sample (74 mg/L). The Municipality may wish to consider installing an appropriately sized effluent filter on the septic tank.

### **Physical Conditions of the Sewage System:**

DMRC's inspector walked around the tile field and septic tank area during the inspection. The tile field appeared to be in good condition with no concerning conditions observed, except for a few locations that had been disturbed (lack of vegetation), most likely due to lawnmowing operations. Mr. Frigault advised he had discussed the recommendation from last year's report to re-topsoil and seed the tile bed with the Municipality and it appeared that the Municipality was not interested in proceeding with this recommendation at this time. He has reviewed the conditions over the year and the conditions appear to be stable. Applying more topsoil and seeding the respective areas in the spring is recommended.

There was no detectable septic odour encountered when the access riser lid and the dosing pump enclosure were opened, unless you were within the vicinity of the access openings. The valves stems can be operated, however they are quite rusty and in poor condition. It is recommended that the valve stems be replaced.

The pump control panel and the dosing chamber appeared to be in good working order. The autodialer system was able to "call-out" during the inspection.

The splitter valve chamber was inspected and although the chamber did contain some water, there appears to be no need for concern and the valves are above the water level. OCWA confirmed that a poly-seal was installed on December 15<sup>th</sup>, 2012, to prevent water from infiltrating into the structure.

OCWA advised that the annual inspection of the collection system was completed on December 17, 2012 and no deficiencies were reported.

### **Annual Report Recommendations:**

1. The "Dosing Pump Elapsed Time Weekly Record Sheets" provided in the Operations and Maintenance Manual originally provided by Henderson Paddon & Associates for recording and collecting data on dosing pump operation should continue to be used by operations staff. Operators should continue to keep a project-specific journal of their site visits, alarm conditions, maintenance, repairs and observations.
2. Operations staff should continue to monitor the air relief valve at SANMH2.
3. The Municipality should update the existing Operations and Maintenance Manual to accurately incorporate the upgraded dosing pump components.
4. OCWA and the Municipality should consider replacing the effluent discharge control valve stems.

5. Continue to monitor the condition of the lawn on the tile bed and if required arrange to topsoil and seed the disturbed areas.
6. OCWA and the Municipality should consider installing an appropriately-sized effluent filter in the septic tank.

It is the writer's overall opinion that the system is in good working order, and that the housing development within Phases 1 and 2B of the subdivision should continue with regards to the available capacity of the subdivision's existing sewage system.

Should you have any questions or concerns with the above and enclosed, please do not hesitate to contact the writer.

Yours truly,

**DARRYL M. ROBINS CONSULTING INC.**



Laura Swanson, P.Eng.  
Civil-Environmental Engineer

LAS/br  
Encl.

Cc: Mr. Bob Hart, CPHI, Public Health Manager, Grey Bruce Health Unit  
Mr. John Nichol, Lakewood Subdivision Ratepayer's Association  
Mr. David Trombley, OCWA (via email)

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**INSPECTOR'S REPORT:**

<b>Project Title:</b>	<u>Lakewood Subdivision</u>	<b>Inspection Date:</b>	<u>Oct. 16, 2012</u>
<b>Inspector:</b>	<u>Laura Swanson, P.Eng</u>	<b>Inspection Time:</b>	<u>10:00 am</u>
<b>Location:</b>	<u>Lakewood Subdivision</u>	<b>File No.:</b>	<u>M09010</u>

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- The writer met with Mr. Leo-Paul Frigault (Operations Manager, OCWA) and Mr. Paul Mader (Operations, OCWA) on October 16, 2012 at 10:00 am.
- OCWA confirmed that the autodialer was now functioning. A test on the high level alarm was conducted at the site meeting. The alarm beacon and high level alarm light on the control box appeared to be in satisfactory working condition. OCWA reported that the alarm call was received on the designated phone numbers.

Station telephone number: 519-793-4434

The alarm dialer will call out for the following conditions:

- a) Pump Failure
- b) High Level Alarm
- c) Power Failure

The current alarm call-out protocol is as follows:

1. OCWA operator on-call cell phone 519-372-3034
  2. Lion' Head Water Treatment Plant 519-793-6900
  3. Warton Water Treatment Plant 519-534-1610
- The writer walked over the tile field looking for any signs of vandalism, rodent infestation, erosion or breakouts. No major deficiencies at the tile field were noted, but the vegetation was sparse at the corners of the tile bed. Mr. Frigault advised he had discussed the recommendation from last year's report to re-topsoil and seed the tile bed with the Municipality and it appeared that the Municipality was not interested in proceeding with this recommendation at that time. Mr. Frigault has reviewed the conditions over the year and the conditions appear to be stable. It may be beneficial to re-topsoil and seed disturbed areas where the lawnmower has churned up the sand of the tile field.
  - There was no detectable septic odour encountered when the access riser lid and the dosing pump enclosure were opened, unless you were within the vicinity of the access openings. Prior to the opening of the lid, the area around the septic tank was odour free.
  - The discharge control valve stems (dosing chamber) that control discharge to the tile fields were operable, however the handles are rusty and in poor condition.

- An inspection of the splitter valve chamber to the tile fields was conducted. There were no deficiencies noted. The chamber did contain some water; the valves were above the water level. The water was clear and expected to be from infiltration. A poly-seal (bowl) had not been installed. Mr. Mader advised that the structure needs to be parged to prevent infiltration.
- The control panel, enclosure and associated equipment appeared to be in good condition and operating normally.
- Pumping rate tests were conducted on the effluent pumps at this inspection. Each pump was run for 1 minute and Mr. Frigault read the liquid level on rod. Ms. Swanson recorded the reading and completed the calculations in the office. The resulting effluent pump rates were calculated to be:

Pump No. 1:	274.1 L/min
Pump No. 2:	328.9 L/min

It is noted that there is a significant increase in the pumping rates since 2012. It is speculated that there was an error during the test. It is recommended to re-test the pumps at the 2013 annual inspection and ensure that the pumps are each run for 3 to 5 minutes with additional consideration given to incoming flows for an accurate test period. OCWA should continue to using the pumping rates from the 2011 inspection.

- OCWA identified that the annual inspection of the maintenance holes had not been completed yet.
- Digital photos of the existing conditions of the sewage system were taken and are saved under the project file number at Darryl M. Robins Consulting Inc.
- Mr. Frigault provided a copy of an 'Unscheduled Work Order' and advised that the bottom of the inlet tank was cleaned. The scum off the surface of the pump station was also cleaned and pumped out by Scott Septic Services.
- Mr. Mader took samples of the sewage effluent from the dosing chamber at the facility for lab analysis.

Report finalized on December 21, 2012.

**DARRYL M. ROBINS CONSULTING INC.**



Laura Swanson, P.Eng  
Civil – Environmental Engineer

TABLE 2  
 LAB ANALYSIS RESULTS OF SEPTIC TANK EFFLUENT  
 LAKEWOOD SUBDIVISION SEWAGE SYSTEM  
 2012 ANNUAL INSPECTION REPORT

Date	BOD mg/L	Total Suspended Solids mg/L	pH pH units	Nitrate mg/L	Ammonia (N) Total mg/L	Total Kjeldahl Nitrogen mg/L	Phosphorus Total mg/L
May 30/03	155	76	7.38	0.2	58.8	75.8	10.7
Sept. 7/04	82	22	7.35	0.1	62.4	70.9	9.88
Sept. 19/05	53	44	7.41	<0.1	63.9	75.5	10.6
Sept. 22/06	93	90	7.47	0.1	63.4	74.6	9.65
Nov. 26/07	64	18	7.7	<0.1	59.1	67.4	9.49
Nov. 18/08	81	32	8.12	0.1	68.5	71.1	9.6
Nov. 24/09	62	44	N/A	<0.05	74.5	73.9	9.59
Oct. 19/10	74	23	7.77	<0.06	69.9	66.3	10.1
Nov. 15/11	74	10	7.85	<0.05	63.1	63.7	8.85
Oct. 16/12	89	98	8.00	<0.05	68.5	70.3	10.2
Typical Concentration Range for Septic Effluent	140 to 200	50 to 100				40 to 100	5 to 15

- Typical concentration range for septic tank effluent were obtained from the USEPA On-Site Wastewater Treatment Systems Manual
- Lab Analysis Conducted by Caduceon Environmental Laboratories Inc (2003-2008)
- Lab Analysis Conducted by SGS Lakefield Research (2009-2012)

N/A - sample parameter result not provided



SGS Canada Inc.  
 P.O. Box 4300 - 185 Concession St.  
 Lakefield - Ontario - K0L 2H0  
 Phone: 705-652-2000 FAX: 705-652-6365

Project : PO#017018

October-29-12

**OCWA-Southampton (Lakewood STP)**

Attn : Dave Trombley

Date Rec. : 17 October 2012

LR Report: CA12347-OCT12

P.O. Box 760  
 Southampton, ON  
 N0H 2L0, Canada

Copy: #1

Phone: 519-797-2561  
 Fax:pdf, 519-941-1794

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1:	2:	3:	4:	6:
	Analysis Start Date	Analysis Start Time	Analysis Approval Date	Analysis Approval Time	Eff Eff-Effluent
Sample Date & Time					16-Oct-12 11:00
Temperature Upon Receipt [°C]	---	---	---	---	9.0
Biological Oxygen Demand (BOD5) [mg/L]	17-Oct-12	17:23	23-Oct-12	12:54	89
Total Suspended Solids [mg/L]	24-Oct-12	13:03	29-Oct-12	13:00	98
pH [no unit]	18-Oct-12	09:34	19-Oct-12	14:30	8.00
Total Kjeldahl Nitrogen [as N mg/L]	17-Oct-12	13:00	21-Oct-12	14:52	70.3
Ammonia+Ammonium (N) [mg/L]	17-Oct-12	19:00	21-Oct-12	14:43	68.5
Nitrite (as N) [mg/L]	17-Oct-12	17:05	24-Oct-12	12:15	< 0.06
Nitrate (as N) [mg/L]	17-Oct-12	17:05	24-Oct-12	12:15	< 0.05
Nitrate + Nitrite (as N) [mg/L]	17-Oct-12	17:05	24-Oct-12	12:15	< 0.06
Phosphorus (total) [mg/L]	19-Oct-12	11:58	23-Oct-12	15:09	10.2

Carrie Greenlaw  
 Project Specialist  
 Environmental Services, Analytical

# UNSCHEDULED WORK ORDER

Called in by: Leo-Paul Frigault

Date received: August 14<sup>th</sup> 2012 Time received: 8:00 AM

Location: Lakewood Subdivision Sewage Treatment System

Reason for work order: Clean inlet tank

## Work Performed/Parts needed

Bottom of inlet tank was cleaned with the help of Scott Septic Services.
Scum off the surface of the lift station was also cleaned and pumped out using Scott Septic Services.

ORG#: 1131

Operator: Karl Rennick

Date Started: August 15<sup>th</sup> 2012 Time Started: 10:00 AM

Date Finished: August 15<sup>th</sup> 2012 Time Finished: 11:30 AM

Total actual hours on job: 1.5 hours

Signature: *Karl Rennick* Date: Aug 15/12



**Laura Swanson**

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**From:** Kiersten Moore [kiersten.nbp@amtelecom.net]  
**Sent:** November-07-12 8:38 AM  
**To:** Laura Swanson; Troy Cameron  
**Subject:** Re: Lakewood Annual Inspection

Hi Laura:

Troy is out of the Office this week.

There have not been any new connections to the Lakewood Sewer System since 2011; therefore, the count remains at 37 dwellings.

Sincerely,

Kiersten Moore  
Public Works Administrative Assistant  
Municipality of Northern Bruce Peninsula  
T: (519) 793-3522 ext. 239  
F: (519) 793-3823  
E: [kiersten.nbp@amtelecom.net](mailto:kiersten.nbp@amtelecom.net)

**From:** [Laura Swanson](#)  
**Sent:** Tuesday, November 06, 2012 2:26 PM  
**To:** [Troy Cameron](#)  
**Cc:** 'Kiersten Moore'  
**Subject:** FW: Lakewood Annual Inspection

Good afternoon Troy,

Could you please arrange to provide us with the number of dwellings that are currently connected to the Lakewood Subdivision Sewage System? We are proceeding with completing the Annual Report for Lakewood's Sewage System.

Our records indicated that as of 2011 there were 37 dwellings connected.

Thanks,  
Laura

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**From:** Laura Swanson [<mailto:iswanson@dmrconsulting.ca>]  
**Sent:** October-15-12 10:50 AM  
**To:** Troy Cameron ([troy.nbp@amtelecom.net](mailto:troy.nbp@amtelecom.net)); 'bill.nbp@amtelecom.net'  
**Cc:** 'Leo-Paul Frigault'  
**Subject:** Lakewood Annual Inspection

Good afternoon Troy and Bill,

We wanted to advise that the Annual Lakewood Subdivision Septic System Inspection will be undertaken tomorrow (October 16, 2012) at 10am. Would the Municipality like to attend the inspection as well?

Troy could you please provide us with the number of dwellings that are currently connected to the Lakewood Subdivision Sewage System?

Regards,

Laura Swanson, P.Eng.

DARRYL M. ROBINS CONSULTING INC.

4844 Highway No. 6  
General Delivery  
Miller Lake, ON  
N0H 1Z0

Email: [lswanson@dmrconsulting.ca](mailto:lswanson@dmrconsulting.ca)  
Phone / Fax: 519 795-7094  
Cell: 519 270-7757

TABLE 1  
DOSING PUMP RECORDS  
(ELAPSED TIME METER READINGS)  
LAKEWOOD SUBDIVISION  
OCTOBER 8, 2011 TO OCTOBER 11, 2012

DATE	TIME	Time (dec)	diff in hour	PUMP NO. 1				PUMP NO. 2				COMBINED AVERAGE DAILY FLOW (L/d)	OPERATOR'S NOTES		
				RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (min)	VOLUME PUMPED (L)	ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)	RECORDED RUN TIME (hrs)	ELAPSED PUMP TIME (min)	VOLUME PUMPED (L)			ELAPSED TIME (days)	AVERAGE DAILY FLOW (L/d)
06-Oct-11	07:00:00	7.00	7.00	339.86	2.78	37,363	7.29	259.48	1.73	22,109	3,032	8,156	RSS OK	Stop & Start OK	
13-Oct-11	07:00:00	9.00	2.00	342.64	3.83	51,475	14.08	261.21	3.25	41,535	2,949	6,604	RSS OK		
27-Oct-11	09:00:00	8.50	-0.50	348.45	1.98	26,611	7.98	266.04	1.58	20,192	2,531	5,866	RSS OK		
04-Nov-11	08:30:00	14.00	5.50	349.84	1.39	18,682	3.23	267.00	0.96	12,629	3,799	9,585	RSS OK		
07-Nov-11	10:30:00	10.50	-3.50	351.52	1.68	22,579	6.85	268.38	1.38	17,636	2,573	5,867	RSS OK		
14-Nov-11	11:00:00	11.00	0.50	352.31	0.79	10,618	3.02	268.97	0.59	7,540	3,02	2,496	6,011	RSS OK	
17-Nov-11	11:00:00	11.00	0.00	354.06	1.75	23,520	10.00	270.30	1.33	16,997	10.00	1,700	4,052	RSS OK	
27-Nov-11	09:40:00	9.67	-1.33	355.36	1.30	17,472	3.94	270.54	0.24	3,067	3.94	778	5,207	RSS OK	
09-Dec-11	11:00:00	12.83	-1.83	357.60	1.24	16,666	6.92	272.42	0.90	11,502	6.92	1,661	4,068	RSS OK	
16-Dec-11	10:00:00	9.00	-2.00	359.33	1.73	23,251	5.92	273.54	1.12	14,314	5.92	2,419	6,349	RSS OK	
22-Dec-11	09:00:00	10.58	-1.58	360.40	1.07	14,381	5.07	274.18	0.64	8,179	5.07	1,615	4,453	Pump 2 faulting, Pump 1 OK	
06-Jan-12	09:00:00	9.00	5.95	369.69	2.09	28,090	6.25	274.53	0.32	4,090	6.25	655	5,150	Pump 2 ran in auto	
12-Jan-12	09:00:00	10.00	1.00	371.28	1.59	21,370	6.97	276.89	2.36	30,161	7.04	4,283	7,318	Pump 2 faulting, Pump 1 OK	
19-Jan-12	09:10:00	9.17	-0.83	373.12	1.84	24,730	6.97	277.13	0.24	3,067	6.97	440	3,991	RSS OK	
26-Jan-12	07:00:00	7.00	-2.17	374.28	1.16	15,590	6.91	278.65	1.52	19,426	6.91	2,811	5,068	RSS OK	
02-Feb-12	09:40:00	9.67	2.67	375.66	1.38	18,547	7.11	279.15	0.50	6,390	7.11	899	3,507	RSS OK	
09-Feb-12	08:45:00	8.75	-0.92	377.25	1.59	21,370	7.96	280.35	1.20	15,336	7.96	1,926	4,610	RSS OK	
17-Feb-12	12:30:00	12.50	3.75	380.10	2.85	38,304	10.16	282.63	2.28	29,138	10.16	2,869	6,640	RSS OK	
27-Feb-12	08:25:00	8.42	-4.08	380.54	0.44	5,914	2.83	283.14	0.51	6,518	2.83	2,303	4,393	RSS OK	
01-Mar-12	07:00:00	7.00	-1.42	382.59	2.05	27,552	8.94	285.17	2.03	25,943	8.94	2,902	5,983	RSS OK	
10-Mar-12	08:30:00	8.50	1.50	384.18	1.59	21,370	5.06	286.39	1.22	15,592	5.06	3,080	7,301	RSS OK trip floats	
15-Mar-12	08:30:00	8.50	0.00	387.92	3.74	50,266	12.00	289.26	2.87	36,679	12.00	3,057	7,245	RSS OK	
07-Apr-12	11:20:00	11.33	2.83	391.37	3.45	46,368	11.12	291.72	2.46	31,439	11.12	2,828	6,998	RSS OK	
12-Apr-12	09:20:00	9.33	-2.00	392.92	1.55	20,832	4.92	292.96	1.24	15,847	4.92	3,223	7,460	RSS OK	
26-Apr-12	07:00:00	7.00	-3.33	396.96	4.06	54,566	13.90	298.23	5.27	67,351	13.90	8,769	8,769	RSS OK	
03-May-12	08:10:00	8.17	1.17	398.86	1.88	25,267	7.05	299.38	-0.88	4,856	7.05	689	2,896	RSS OK	
11-May-12	13:15:00	13.25	5.08	401.09	2.23	29,971	8.21	299.38	1.53	19,553	8.21	1,281	4,931	RSS OK	
18-May-12	07:00:00	7.00	-6.25	402.71	1.62	40,271	6.74	300.77	1.39	17,764	6.74	2,636	5,866	RSS OK	
24-May-12	07:00:00	7.00	0.00	404.46	1.75	23,520	6.00	302.39	1.62	20,704	6.00	3,451	7,371	RSS OK	
29-May-12	07:00:00	7.00	0.00	406.16	1.70	22,848	5.00	303.60	1.21	15,464	5.00	3,093	7,662	RSS OK	
07-Jun-12	07:00:00	7.00	0.00	409.14	2.98	40,051	9.00	305.76	2.16	27,605	9.00	3,067	7,517	RSS OK	
12-Jun-12	07:00:00	7.00	0.00	410.96	1.82	24,461	5.00	307.16	1.40	17,892	5.00	3,578	8,471	RSS OK	
19-Jun-12	07:00:00	7.00	0.00	413.39	2.43	32,659	7.00	309.26	2.10	26,838	7.00	3,834	8,500	RSS OK	
28-Jun-12	07:00:00	7.00	0.00	416.18	2.79	37,498	9.00	311.06	1.80	23,004	9.00	2,556	6,722	RSS OK	
06-Jul-12	07:03:00	7.05	0.05	419.96	3.78	50,803	8.00	314.28	3.22	41,152	8.00	5,143	11,491	RSS OK	
13-Jul-12	11:30:00	11.50	4.45	423.08	3.12	41,933	7.19	318.46	4.18	53,420	7.19	7,435	13,270	RSS OK	
23-Jul-12	12:30:00	12.50	1.00	427.25	4.17	56,045	10.04	319.55	1.09	13,930	10.04	1,387	6,968	RSS OK	
29-Jul-12	13:00:00	13.00	0.50	428.49	1.24	16,666	6.02	320.80	1.25	15,975	6.02	2,653	5,421	RSS OK	
02-Aug-12	07:00:00	7.00	-6.00	431.14	2.65	35,616	3.75	322.93	2.13	27,221	3.75	7,259	16,757	RSS OK	
10-Aug-12	17:00:00	17.00	10.00	434.60	3.46	46,502	8.42	326.06	3.13	40,001	8.42	4,753	10,278	RSS OK	
16-Aug-12	10:05:00	10.08	-6.92	437.24	2.64	35,482	5.71	327.31	1.25	15,975	5.71	2,797	9,009	RSS OK	
22-Aug-12	08:00:00	8.00	-2.08	439.01	1.77	23,789	5.91	328.96	1.65	21,087	5.91	3,566	7,589	RSS OK	
29-Aug-12	12:05:00	12.08	4.08	441.65	2.64	35,482	7.17	330.72	1.76	22,493	7.17	3,137	8,086	RSS OK	
07-Sep-12	08:00:00	8.00	-4.08	444.34	2.69	36,154	8.83	333.91	2.19	27,988	8.83	3,170	7,264	RSS OK	
08-Sep-12	12:45:00	12.75	4.75	444.85	0.51	6,854	1.20	333.16	0.25	3,195	1.20	2,667	8,389	RSS OK power outage	
12-Sep-12	13:45:00	13.75	1.00	445.95	1.10	14,784	4.04	334.05	0.89	11,374	4.04	2,814	6,472	RSS OK	
13-Sep-12	07:15:00	7.25	-6.50	446.15	0.20	2,688	0.73	334.05	0.00	0	0.73	0	3,686	RSS OK	
21-Sep-12	07:28:00	7.47	0.22	448.21	2.06	27,686	8.01	335.74	1.69	21,598	8.01	2,697	6,154	RSS OK	
27-Sep-12	07:00:00	7.00	-0.47	449.84	1.63	21,967	5.98	337.17	1.43	18,275	5.98	3,056	6,719	RSS OK	
05-Oct-12	07:10:00	7.17	0.17	452.14	2.30	30,912	8.01	338.71	1.54	19,681	8.01	2,458	6,319	RSS OK	
11-Oct-12	07:10:00	7.17	0.00	453.93	1.79	24,058	6.00	340.27	1.56	19,927	6.00	3,323	7,332	RSS OK	

PUMPING TEST FLOW RATES: (OCT. 15, 2011)  
PUMP #1: 224.0 L/min  
PUMP #2: 213.0 L/min

**PUMP 1**  
YEARLY AVERAGE DAILY FLOW: 4,163 L/d  
MAX. DAILY FLOW RATE: 9,990 L/d  
COMBINED AVERAGE DAILY FLOW: 6,887 L/d  
COMBINED MAXIMUM DAILY FLOW RATE: 16,757 L/d  
ASSUMED ERRONEOUS READINGS EXCLUDED FROM CALCULATIONS

**PUMP 2**  
YEARLY AVERAGE DAILY FLOW: 2,724 L/d  
MAX. DAILY FLOW RATE: 7,435 L/d