Memo

Water & Earth Technologies, Inc.
Water Resources and Environmental Consulting

Date: December 3, 2008

To: Kevin Stewart and Chad Kudym

From: Markus Ritsch

Subject: **November 2008 ALERT Data Analysis**

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's Nova Star 4.0 base station (ALERT 2) were analyzed for the period November 1 through November 30, 2008.

II. General System Analysis Summary

A total of 310,617 data records were analyzed from the ALERT 2 base station. Meteorological sensors account for 68 percent, water level sensors 5 percent, and rain sensors 2 percent of the total monthly records.

More than ninety-nine percent (99.67%) of the received data reports were flagged as "good" by the Nova Star validation process. Roughly, 1,010 reports were flagged as "bad". Of these "bad" reports, 320 originated from Elbert (ID 1439 & 1437) and 58 originated from Squaw Mountain (ID 2191).

The system-wide radio traffic loading was 10,354 reports per day with an average hourly loading of 431 reports. The peak hourly traffic loading was 816 reports, which occurred on November 2, between 1:00 AM and 2:00 AM. A plot of monthly average and peak hourly traffic loading is provided.

III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. System-wide, the ALERT 2 base station received approximately 87 percent of the non-incrementing timer reports. The worst performing rain sensors for the month are summarized (Table 1).

Table 1. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2190	1660	1350	1710	1600	1600	1600	4130	1540	840	1520	
140	2190	110	540	540	110	1660	4560	1700	920	4200	
4150	140	2190	1600	1710	950	4140	4240	740	310	4140	
4060	4170	1370	1350	4080	1710	1350	4570	1360	110	4470	
4470	4150	620	710	4060	540	1710	1710	1660	820	4560	
4530	4530	840	4330	4150	4530	4530	4080	1480	2850	4850	

Sensors identified as having poor timer performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

Sensor ID 1460 has a 24-hour timer reporting interval and Sensor ID 1810 has an 18-hour timer-reporting interval.

IV. Rain Sensor Event Reporting Summary

A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors (excluding Hayman sensors) were analyzed to quantify the District-wide statistical total monthly tip summary (Table 2).

Table 2. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	2.82	Only the 1-mm rain sensors were included in the analysis
Median	2	Only the 1-mm rain sensors were included in the analysis
Standard deviation	2.23	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	9.50	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Many sensors
Maximum total count	10	Morrison (ID 2330)

The highest reporting rain sensor this month was Morrison (ID 2330) with 10 tips. Irrigation sprinklers to not influence this sensor. No other sensors reported more than the mean plus three standard deviations.

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 3).

Table 3. Monthly Summary of District-Wide Mean Total 1-mm Tip/Count

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
2006	4.62	5.92	18.39	20.47	19.44	13.75	74.03	46.89	24.17	41.13	5.04	16.45	24.19
2007	11.56	5.40	29.75	65.03	68.30	15.87	36.20	46.38	22.13	29.50	6.54	11.29	29.00
2008	4.05	7.38	12.26	20.57	54.82	26.06	16.43	90.20	37.54	19.59	2.82		

C. Sensors with a Jump of Six or More in the Sequential Count

No sensors had a jump in sequential count of more than six (Table 4). These large jumps are investigated below.

Table 4. Sensors with a Jump of More than 6 in Sequential Count

Sensor Description	Sensor ID	Comment
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 98 percent. A total of 198 incrementing reports were received and a total of 203 were expected. The total loss of incrementing reports for the month was approximately 2 percent. Those sensors with the worst rain event transmission performance characteristics are summarized (Table 5).

Table 5. Monthly Summary of Sensors with the Most Missed Tips

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1640	4520	2930	1710	1600	1600	1660	1600	870	840	4840	
2190	4820	540	1600	2320	2750	4820	1100	1350	860	700	
750	4530	2730	540	4150	2710	4080	1660	4090	700	2820	
4570	4470	2210	700	1710	310	2340	870	1050	970	1550	
2990	4810	110	110	4710	4090	2330	1710	2370	2190	--	
--	700	1350	840	1350	4170	4060	410	120	2820	--	

Sensors identified as having poor event performance in multiple months are shaded with unique colors. A developing trend can thus be identified from the color shading as the year progresses.

The incrementing data series for those sensors with an event performance value of less than 70 % are manually inspected.

a. SBC at South Boulder Ditch (ID 4840)

This sensor had a performance value of 67%. The base station missed only 1 tip from a total of 3 expected tips for the month. No problems were identified at this station.

V. Heavy Radio Traffic Analysis

Periods exceeding 700 messages per hour are analyzed independently in an attempt to identify rain tip sequences where 3 or more, sequential messages are lost.

A. The Heaviest Hourly Traffic Periods This Month

The hourly periods of highest radio traffic this month include:

Peak Traffic Periods	Reports/hour	Hour Beginning
Peak Hourly Traffic	816	11/2/08 1:00 AM
2nd Max	553	11/13/08 4:00 PM
3rd Max	541	11/5/08 11:00 AM
4th Max	539	11/6/08 11:00 AM
5th Max	537	11/13/08 1:00 PM

B. November 2, 2008

The heaviest traffic period occurred on November 2, between 1:00 AM and 2:00 AM. Incrementing rain records from the 1-mm gages for the heavy radio traffic period were examined to characterize the loss of sequential incrementing tip transmissions (Table 6). During the heavy traffic period, a total of 2 reports were expected and only 2 were received yielding a loss of approximately **0.00%** of the incrementing transmissions.

Table 6. Peak Traffic Analysis - Loss of Incrementing Tip Reports

	Occurrences of lost sequential tip reports during period			
Heavy Traffic Period (November 2)	**Loss of 3 sequential tips**	**Loss of 4 sequential tips**	**Loss of 5 sequential tips**	**Loss of 6 or more sequential tips**
00:01 AM to 4:00 AM	0	0	0	0

VI. Unknown Device Analysis – Received Data Log

The ALERT IDs present in the audio signal received by the decoder are compared against a list of "active" device IDs that are defined within NovaStar. Those IDs received by the decoder that are not defined within NovaStar are considered to be "unknown" and may be the result of radio noise or problems with the telemetry system. The reception of "unknown" device reports for the month is summarized (Table 7).

Table 7. Summary of Unknown IDs

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	140
Total reports from unknown IDs	1,023
Unknown IDs with only a single received report (potential noise)	104
Total reports from all IDs – RecData Log entire month	256,403
Unknown reports as a fraction of total reports	0.40%

The total number of reports from unknown sensors is very small relative to the total reports received for the month.

A number of "unknown" sensors had multiple reports which may indicate the existence of a transmitter that is sending information on an ID that is not currently defined within NovaStar. The unknown IDs with multiple reports including the number of reports received by each are shown (Table 8).

Table 8. Reports Received by Unknown IDs

Sensor ID	Reports
8102	276
8101	230
8100	230
2725	44
2726	33
2736	9
4636	8
4087	7
4399	7
4766	6
4760	6
4768	4
4063	4
4748	4
4644	3
2195	3
4740	3
4093	3
4828	3
4646	3
2365	3
4199	2
4639	2
1657	2
1661	2
4656	2
2239	2
2334	2
4279	2
4012	2
4083	2
4454	2
991	2
4863	2
4756	2
4839	2

The “unknown” device reports are analyzed temporally to understand when they are received during the day (Table 9). The goal of this analysis is to determine a pattern of occurrence that may correspond to a source of noise in the system, such as the use of a wireless microphone nearby.

Table 9. Temporal Distribution of Unknown Reports

Hour (AM)	Reports	Hour (PM)	Reports
0:00-00:59	15	12:00-12:59	19
1:00-1:59	98	1:00-1:59	92
2:00-2:59	8	2:00-2:59	20
3:00-3:59	14	3:00-3:59	16
4:00-4:59	100	4:00-4:59	104
5:00-5:59	17	5:00-5:59	12
6:00-6:59	13	6:00-6:59	9
7:00-7:59	114	7:00-7:59	93
8:00-8:59	27	8:00-8:59	12
9:00-9:59	16	9:00-9:59	10
10:00-10:59	100	10:00-10:59	87
11:00-11:59	14	11:00-11:59	13

Sensors 8100, 8101, and 8102 transmitted a large number of timer reports on the intervals of 1:00, 4:00, 7:00 and 10:00.

VII. Issues Identified this Month

Sensors with a large number of invalid reports:

Sensor ID	Reports	Description	Group
1439	165	Elbert	Wind Gust
1437	155	Elbert	Wind Speed Average
2191	58	Squaw Mountain	Relative Humidity
4774	47	Cal-Wood Ranch	Barometric Pressure
2744	41	Castle Rock	Wind Gust
755	36	Quincy Reservoir	Battery Voltage Analog
139	35	Blue Mountain	Wind Gust
903	30	Aurora Reservoir	Barometric Pressure
4724	30	Sugarloaf	Wind Gust
137	28	Blue Mountain	Wind Speed Average
4704	26	Ward C-1	Wind Gust
2724	25	Salisbury Park	Wind Gust
4744	23	Louisville Lake	Wind Gust
1914	18	Brighton	Wind Gust
2704	17	Highlands Ranch WTP	Wind Gust
751	15	Quincy Reservoir	Relative Humidity
971	13	Pump Sta 3	Relative Humidity
906	13	Aurora Reservoir	Wind Direction
905	10	Aurora Reservoir	Wind Speed Average
4764	10	Cal-Wood Ranch	Wind Gust

Sensors reporting frequently (over reporting):

Sensor ID	Reports	Description	Group
749	5476	Quincy Reservoir	Wind Gust
4707	4311	Ward C-1	Wind Speed Average & Azimuth
2747	3490	Castle Rock	Wind Speed Average & Azimuth
2727	3222	Salisbury Park	Wind Speed Average & Azimuth
2752	2999	Castle Rock	Temperature
908	2920	Aurora Reservoir	Solar Radiation
903	2914	Aurora Reservoir	Barometric Pressure
141	2873	Blue Mountain	Relative Humidity
2188	2873	Squaw Mountain	Wind Direction
143	2872	Blue Mountain	Fuel Moisture
2192	2864	Squaw Mountain	Temperature
144	2859	Blue Mountain	Fuel Temperature
2744	2858	Castle Rock	Wind Gust
139	2856	Blue Mountain	Wind Gust
137	2854	Blue Mountain	Wind Speed Average
2751	2854	Castle Rock	Relative Humidity

Sensors reporting infrequently (under reporting):

Sensor ID	Reports	Description	Group
2230	1	Bear Cr below Cub	Precipitation
2253	1	Rosedale	Water Level PT
835	1	Side Creek Park	Battery Voltage HSE
333	2	Van Bibber @ Hwy 93	Water Level PT
1463	2	Stapleton	Barometric Pressure
613	3	Harvard @ Jackson	Water Level PT-HSE
1043	3	Lena @ U.S. Hwy 6	Water Level PT-HSE
650	4	Iliff Pond	Precipitation
330	4	Van Bibber @ Hwy 93	Precipitation
1600	4	Englewood Dam	Precipitation
200	4	Leyden Reservoir	Precipitation
135	4	Simms Street	Battery Voltage HSE
125	4	West Woods	Battery Voltage HSE
1300	4	Hidden Lake	Precipitation
1305	4	Hidden Lake	Battery Voltage HSE
115	4	Ralston Reservoir	Battery Voltage HSE
1315	4	LDC at 64th	Battery Voltage HSE
320	5	Sports Complex	Precipitation
1605	5	Englewood Dam	Battery Voltage HSE
335	5	Van Bibber @ Hwy 93	Battery Voltage HSE
1310	5	LDC at 64th	Precipitation
325	5	Sports Complex	Battery Voltage HSE
645	5	Goldsmith @ Eastman	Battery Voltage HSE
110	5	Ralston Reservoir	Precipitation
1113	5	Gunbarrel	Water Level PT
130	5	Simms Street	12Hr Status Report
215	5	Leyden Confluence	Battery Voltage HSE
205	5	Layden Reservoir	Battery Voltage HSE
105	5	Carr Street	Battery Voltage HSE
120	5	West Woods	Precipitation
1610	6	Holly Dam	12Hr Status Report
1615	6	Holly Dam	Battery Voltage HSE
620	6	Quincy/Highline	Precipitation

Poor timer reporting:

The following sensors reported for the entire month and showed poor timer performance.

Sensor ID	Description	Performance
1520	Marston Lake North	20%
4200	Lazy Acres	45%
4140	Logan Mill	75%
4470	Little Narrows	76.67%
4560	Lyons Diversion NSV	76.67%
4850	Porphory Mtn	76.67%
970	Pump Sta 3	81.67%
4080	Twin Sisters	81.67%
4570	St. Antons	81.67%
4010	Cresent	83.33%
4510	Pinewood Springs	83.33%
4520	Eagle Ridge	83.33%
4170	Pine Brook	85%
4530	Winiger Ridge	85%
4040	Martin Gulch	86.67%
4130	Swiss Peaks	86.67%
4060	Lakeshore	88.33%
4090	Magnolia	88.33%

Poor event reporting:

The following sensors reported for the entire month and showed poor event performance.

Sensor	Performance
4840	67%
700	71%
2820	86%
1550	88%

Low rain total:

Rain Sensor ID	Tips
120	1
610	1
640	1
730	1
870	1

High rain total:

Rain Sensor	Tips
2330	10
1000	9

Large Jump in Sequential Count (bit flip errors/contention loss/transmitter problems):

Sensor Description	Sensor ID	Comment
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Reports from "Unknown Sensors":

The following table shows the "unknown" sensor IDs and the number of reports received for the month.

Sensor ID	Reports
8102	276
8101	230
8100	230
2725	44
2726	33
2736	9
4636	8
4087	7
4399	7
4766	6
4760	6
4768	4
4063	4
4748	4
4644	3
2195	3
4740	3
4093	3
4828	3
4646	3
2365	3
4199	2
4639	2
1657	2
1661	2
4656	2
2239	2
2334	2
4279	2
4012	2
4083	2
4454	2
991	2
4863	2
4756	2
4839	2

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2008_Nov\Novastar_extract_2008Nov.mdb

First Date in Database	11/1/08 12:00 AM	**Total Days**	30.0
Last Date in Database	11/30/08 11:59 PM	**Total Hours**	720.0

Total Records Analyzed 310617

Records by Group

None-ALERT-ID	56211	18%
Wind Gust	44408	14%
Temperature	42553	14%
Relative Humidity	40686	13%
Wind Speed Average & Azimuth	20686	7%
Barometric Pressure	18992	6%
Wind Direction	17809	6%
Wind Speed Average	15971	5%
Water Level PT-HSE	10191	3%
Solar Radiation	8966	3%
Precipitation	4854	2%
Battery Voltage HSE	4089	1%
Water Level Float	3604	1%
Fuel Moisture	3577	1%
Fuel Temperature	3575	1%
Battery Voltage Analog	3245	1%
Soil Moisture	2845	1%
Battery Voltage Digital	2784	1%
Repeater Pass List	594	0%
Water Level PT	489	0%
Precipitation - Mean	484	0%
Repeater Status Report	475	0%
Precipitation - Test	239	0%
Wing Gust	233	0%
12Hr Status Report	189	0%
Battery	186	0%
Longmont Flow Gage	109	0%
Longmont Water Level PT	54	0%
Battery Voltage	17	0%
Handar 585 ALARM Status	14	0%
Total	308129	

Records by Major Group

Meteorologic Sensors	210071	68%
Water Level Sensors	14447	5%
Sensor Status Transmissions	11390	4%
Soil and Fuel Sensors	9997	3%
Rain Sensors	4854	2%
Total	250759	

Records by Validation Type

Good	0	309607	99.67%
Questionable	1	1010	0.33%
	Total	310617	

Sensors With Most Invalid Data

Description	**Sensor**	**Reports**
Elbert	1439	165
Elbert	1437	155
Squaw Mountain	2191	58
Cal-Wood Ranch	4774	47
Castle Rock	2744	41

Traffic Loading Summary

Alert Reports	310617	
Average Daily Traffic	10354	
Average Hourly Traffic	431	
Median Hourly Traffic	430	hour beginning
Peak Hourly Traffic	816	11/2/08 1:00 AM
2nd Max	553	11/13/08 4:00 PM
3rd Max	541	11/5/08 11:00 AM
4th Max	539	11/6/08 11:00 AM
5th Max	537	11/13/08 1:00 PM

Rain Timer Performance

Analyze Rain Sensors

			systemwide average (days) 0.5170		87%
Rain Sensors	**Description**	**Rcv**	**Interval**	**Exp**	**Performance**
120	West Woods	3	17:25	60.00	5%
200	Leyden Reservoir	3	11:27	60.00	5%
330	Van Bibber @ Hwy 93	3	17:26	60.00	5%
650	Iliff Pond	3	23:54	60.00	5%
1300	Hidden Lake	3	11:28	60.00	5%
1600	Englewood Dam	3	11:57	60.00	5%
110	Ralston Reservoir	4	11:38	60.00	7%
130	Simms Street	4	11:37	60.00	7%
320	Sports Complex	4	11:38	60.00	7%
1310	LDC at 64th	4	11:37	60.00	7%
610	Harvard @ Jackson	5	11:42	60.00	8%
620	Quincy/Highline	5	11:42	60.00	8%
640	Goldsmith at Eastman	5	14:44	60.00	8%
1610	Holly Dam	5	11:57	60.00	8%
630	Temple Pond at DTC	6	11:45	60.00	10%
1720	Cherry Cr @ Steele	6	11:45	60.00	10%
530	Fire Station #19	7	14:08	60.00	12%
310	Guy Hill Ranch	8	17:05	60.00	13%
540	Parker/Mississippi	8	11:48	60.00	13%
730	No Name @ Quincy	8	11:47	60.00	13%
870	Murphy Creek GC	8	11:50	60.00	13%
950	Piney at Liverpool	8	11:49	60.00	13%
1710	Shop Creek	8	11:51	60.00	13%
300	Van Bibber Park	9	11:57	60.00	15%
940	Sampson Gulch	9	11:50	60.00	15%
1010	Denver West	9	13:31	60.00	15%
1020	Lena @ Nolte Pond	10	11:53	60.00	17%
1030	NREL/S. Table Mtn.	10	11:51	60.00	17%
1040	Lena @ U.S. Hwy 6	10	11:49	60.00	17%
1050	Jeffco Fairgrounds	10	11:51	60.00	17%
1060	Heritage Square	10	11:51	60.00	17%
1520	Marston Lake North	12	15:10	60.00	20%
220	Upper Leyden	13	10:55	60.00	22%
4200	Lazy Acres	27	10:54	60.00	45%
1350	Chatfield COE	28	11:57	60.00	47%
1370	West Metro FS13	28	13:48	60.00	47%
1530	Bear Creek @ Lowell	30	13:41	60.00	50%
1320	SPR at 3rd Ave	32	12:43	60.00	53%
1900	Niver Detention	32	12:43	60.00	53%
1620	Slaughterhouse Glch	33	12:18	60.00	55%
1340	Sanderson at Xavier	34	11:58	60.00	57%
1500	Powers Park	34	11:55	60.00	57%
1110	Gunbarrel	38	12:35	60.00	63%
4140	Logan Mill	45	15:32	60.00	75%
4470	Little Narrows	46	15:28	60.00	77%
4560	Lyons Diversion NSV	46	15:26	60.00	77%
4850	Porphory Mtn	46	15:11	60.00	77%
970	Pump Sta 3	49	14:01	60.00	82%
4080	Twin Sisters	49	14:25	60.00	82%
4570	St. Antons	49	14:25	60.00	82%
4010	Cresent	50	14:08	60.00	83%
4510	Pinewood Springs	50	14:25	60.00	83%
4520	Eagle Ridge	50	12:28	60.00	83%
4170	Pine Brook	51	13:58	60.00	85%
4530	Winiger Ridge	51	13:38	60.00	85%
4040	Martin Gulch	52	13:12	60.00	87%
4130	Swiss Peaks	52	13:20	60.00	87%

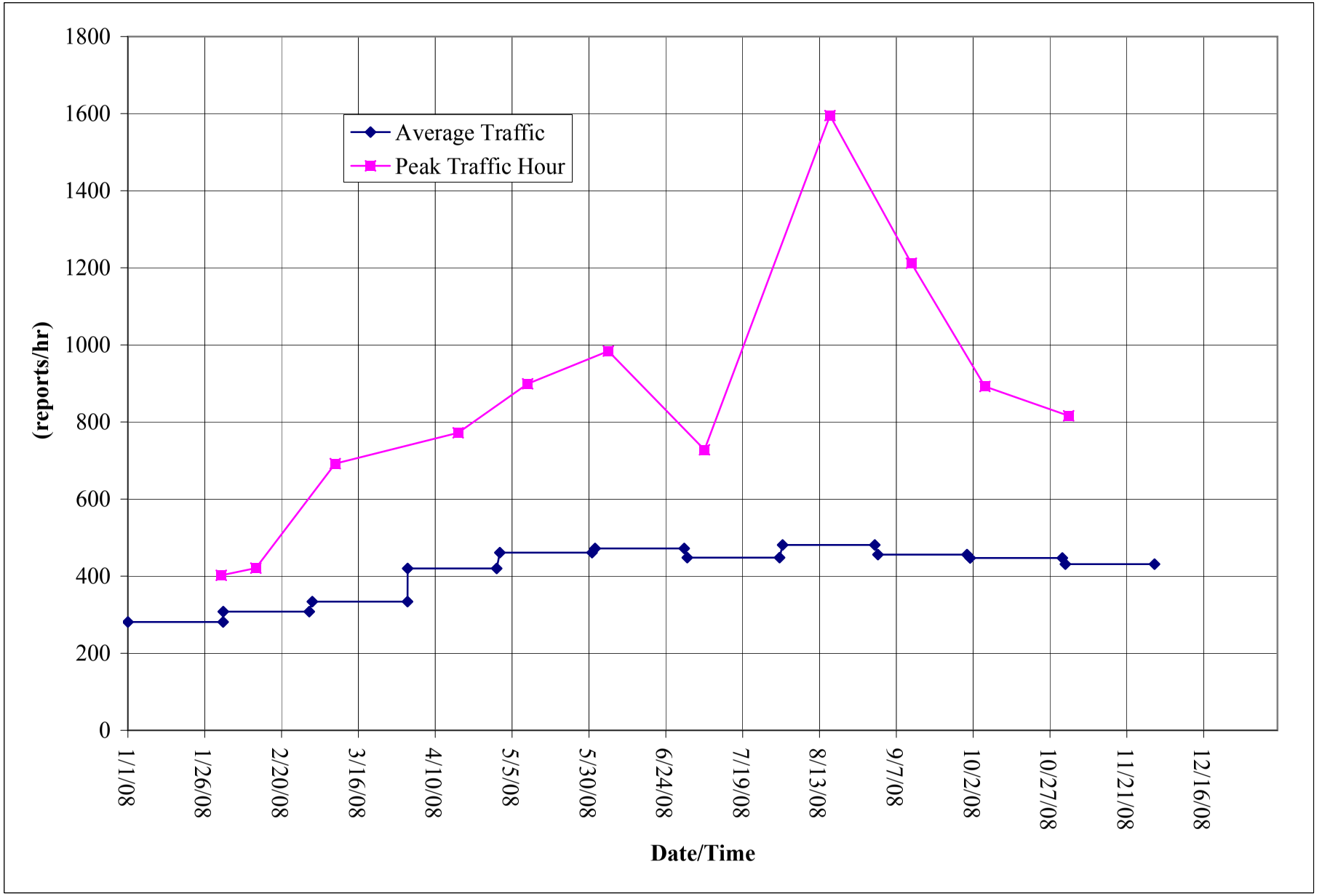
1000	Maple Grove Resv.	53	13:29	60.00	88%
4060	Lakeshore	53	13:20	60.00	88%
4090	Magnolia	53	13:18	60.00	88%
140	Blue Mountain	54	13:06	60.00	90%
2850	Cherry Cr bl Bayou Glch	54	13:06	60.00	90%
4020	Rio Grande	54	13:06	60.00	90%
4050	Walker Ranch	54	13:05	60.00	90%
4160	Sunshine	54	12:51	60.00	90%
4180	Gold Lake	54	13:18	60.00	90%
4240	Sunset	54	12:49	60.00	90%
4250	Geer Canyon	54	12:39	60.00	90%
4350	Conifer Hill	54	13:18	60.00	90%
4360	Justice Center	54	12:53	60.00	90%
4710	Ward C-1	54	13:23	60.00	90%
4750	Louisville Lake	54	13:08	60.00	90%
4840	SBC@S Boulder Ditch	54	12:53	60.00	90%
2990	Tomah Rd-Douglas Cnty	55	12:27	60.00	92%
4150	Gold Hill	55	12:36	60.00	92%
4340	Riverside	55	13:03	60.00	92%
4490	Apple Valley	55	12:51	60.00	92%
4830	SBC @ San Souci	55	12:26	60.00	92%
920	Aurora Town Hall Wx	56	12:26	60.00	93%
1660	SPR at Henderson	56	12:35	60.00	93%
4190	Slaughterhouse	56	12:23	60.00	93%
4770	Cal-Wood Ranch	56	12:38	60.00	93%
4790	Button Rock	56	12:25	60.00	93%
4820	Doudy Draw	56	11:55	60.00	93%
1810	Sand Creek at mouth	38	18:31	40.00	95%
410	Kelly Dam	57	12:24	60.00	95%
700	Toll Gate @ 6th	57	12:12	60.00	95%
2750	Castle Rock	57	12:25	60.00	95%
4070	Bear Peak	57	12:23	60.00	95%
4220	Fling's	57	12:21	60.00	95%
4260	Taylor Mountain	57	12:34	60.00	95%
4550	Boulder Jail	57	12:22	60.00	95%
4730	Sugarloaf	57	12:24	60.00	95%
4860	Fairview Peak	57	12:38	60.00	95%
900	Aurora Reservoir	58	12:15	60.00	97%
1440	Elbert	58	12:20	60.00	97%
1550	Lakewood CC	58	11:55	60.00	97%
2220	Evergreen Lake	58	12:09	60.00	97%
2330	Morrison	58	12:24	60.00	97%
2730	Salisbury Park	58	12:11	60.00	97%
2820	Haskins Gulch Conf	58	12:11	60.00	97%
4030	Red Garden	58	12:09	60.00	97%
4100	Filter Plant	58	12:24	60.00	97%
4110	Betasso	58	12:11	60.00	97%
4270	Cannon Mountain	58	12:36	60.00	97%
4310	Johnny Park	58	12:09	60.00	97%
4810	Shanahan Ridge	58	12:22	60.00	97%
2190	Squaw Mountain	59	11:59	60.00	98%
2210	Hiwan G.C.	59	12:11	60.00	98%
2710	Highlands Ranch WTP	59	11:58	60.00	98%
4230	Golden Age	59	12:09	60.00	98%
4290	Red Hill	59	12:09	60.00	98%
4300	Big Elk Park	59	12:09	60.00	98%
1460	Stapleton	30	23:35	30.00	100%
1630	SPR at Dartmouth	60	11:48	60.00	100%
1920	Brighton	60	11:50	60.00	100%
1570	Brighton Ditch Wx	60	11:34	60.00	100%
1420	Diamond Hill	60	11:21	60.00	100%
750	Quincy Reservoir	60	11:01	60.00	100%

Rain Event Performance

Analyze Rain Sensors

	Reports Received	198	
Systemwide Avg	Total Tips	203	
98%	Data Loss	2.46%	

Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket
4840	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701
700	71%	3	2	0	0	0	0	0	5	7	2	0	0.0393701
2820	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701
1550	88%	6	1	0	0	0	0	0	7	8	1	0	0.0393701
120	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
300	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
410	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
530	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
610	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
640	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
730	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
750	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
870	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
900	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393699
920	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
970	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1000	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
1010	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1030	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1040	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1050	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1060	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1320	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1340	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1350	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1370	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1420	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1440	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1460	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1500	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1530	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
1570	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1620	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1660	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1810	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
1900	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
1920	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
2330	100%	10	0	0	0	0	0	0	10	10	0	1	0.0393701
2710	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
2730	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
2750	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
2850	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
2990	100%	8	0	0	0	0	0	0	8	8	0	0	0.0393701
4020	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4030	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4040	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4050	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4060	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4070	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4100	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4110	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4140	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4150	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4160	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4170	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4190	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4200	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4250	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4270	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4290	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4360	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4470	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4490	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4510	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4530	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4550	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4710	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4750	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4790	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4810	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
4820	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4830	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
	Total Tips	193	5	0	0	0	0	0	198	203	5	1	


1800
1600
1400
1200
1000
800
600
400
200
0
(reports/hr)
Average Traffic
Peak Traffic Hour
1/1/08
1/26/08
2/20/08
3/16/08
4/10/08
5/5/08
5/30/08
6/24/08
7/19/08
8/13/08
9/7/08
10/2/08
10/27/08
11/21/08
12/16/08
Date/Time