Memo

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

Date: December 1, 2006

To: Kevin Stewart, Chad Kudym

From: Markus Ritsch

Subject: **November 2006 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, 2006.

II. General System Analysis Summary

A total of 164,044 individual data records were analyzed. Meteorological sensors account for 84 percent, water level sensors 6 percent, and rain sensors 3 percent of the total monthly transmissions.

Ninety-eight percent of the received data reports were flagged as "good" by the Nova Star validation process. Roughly 4,088 reports were flagged as "bad". Of these "bad" reports, 3,672 originated from the wind sensor (ID 2189 and 2187) at Squaw Mountain. The reception of "bad" data reports from the Squaw Mountain sensor ID's 2189 and 2187 has been a consistent theme throughout the entire year.

The system-wide radio traffic loading this month was 5,468 reports per day with an average hourly loading of 228 reports. The peak hourly traffic loading was 374 reports, which occurred on November 14th between one and two in the afternoon. A plot of monthly average and peak hourly traffic loading is provided.

A new radio repeater was installed by Douglas County to relay the Hayman Burn precipitation gages on the District's primary base receiving frequency of 171.875 MHz. The new Douglas County repeater was activated on July 21, 2006 and configured to re-broadcast only those gages with IDs between 5700 through 6000. A total of zero (0) rain reports were received from the Hayman gages this month. The Hayman gages were winterized toward the end of October which explains why no reports were received from these sensors this month.

The sensors reporting most frequently this month include:

1. Salisbury Park (ID 2727) with 3,537 reports,
2. Ward C-1 (ID 4707) with 3,061 reports,
3. Urban Farm (IDs 1464 and 1466) with 2,817 and 2,791 reports respectively.

The reports from the above sensors are distributed evenly throughout the month.

III. Rain Sensor Timer Reporting Summary

The District completed winterization activities at a number of stations during the month of October and November. Roughly 73 rain sensors reported continuously throughout the month of November. The following analysis assumes that all rain sensors have a 12-hour timer reporting interval. System-wide the ALERT 2 base station received approximately 93 percent of the non-incrementing timer reports. Those rain sensors with the worst timer reporting statistics for the month are summarized (Table 1).

Table 1. Monthly Summary of Sensors with Poor Timer Performance

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1010	1460	1460	2340	1460	1460	1460	1440	1540/320	330	1460	
1460	1660	4820	1460	1330	4820	1440	1460	1460	1720	4080	
1640	4240	4570	1330	540	4830	110	2340	4820	430	4830	
--	--	--	1610	1600	1600	4820	4820	1440	2270	4240	
			1600	4820	2350	4220		110	2340	4560	

Urban Farm (1460), Twin Sisters (4080), SBC at San Souci (4830), Sunset (4240), and Lyons Diversion (4560)

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. For example, sensor 4820 consistently exhibits a poor timer performance value.

Sensor 1460 has a 24-hour timer reporting interval so its timer performance value is actually better than reported here (see data analysis report for May, 2006).

1. Urban Farm (ID 1460)

This sensor has a valid count series extending from November 1 through November 30. Sensor 1460 has a 24-hour timer reporting interval so its timer performance value is actually 100 percent because a total of 31 non-incrementing reports were received for the month.

2. Twin Sisters (ID 4080)

This sensor has a valid count series extending from November 8 through November 30. No reports were received from the sensor between November 1 and November 8. The count series begins from zero on November 8, so we suspect that this sensor was not functioning prior to the 8th and a field maintenance visit was performed on the 8th to re-initialize the station.

3. SBC at San Souci (ID 4830)

This sensor has a valid count series extending from November 1 through November 30. The count series looks reasonable for the entire month. Eighty-three percent of the non-incrementing reports were received at the base for this station.

4. Sunset (ID 4240)

This sensor has a valid count series extending from November 1 through November 30. The count series looks reasonable for the entire month. No transmissions were received from the station on November 15 and November 16. Eighty-three percent of the non-incrementing reports were received at the base for this station.

5. Lyons Diversion (ID 4560)

This sensor has a valid count series extending from November 1 through November 30. The count series looks reasonable for the entire month. No transmissions were received from the station on November 7 and November 8. Eighty-three percent of the non-incrementing reports were received at the base for this station.

IV. Rain Sensor Event Reporting Summary

A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors that reported for the entire month (73 total sensors) were analyzed to quantify the District-wide statistical total monthly tip summary (Table 2).

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

Statistical Parameter	Value	Comments
Mean	5.04	Only the 1-mm rain sensors were included in the analysis
Median	4	Only the 1-mm rain sensors were included in the analysis
Standard deviation	4.23	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	17.73	Several sensors for the month are outside the Mean +/- 3 Std Dev
Minimum total count	0	Several sensors reported no incrementing tip count values
Maximum total count	22	Justice Center (ID 4360)

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

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4.62	5.92	18.39	20.47	19.44	13.75	74.03	46.89	24.17	41.13	5.04	

The average rainfall experienced district-wide decreased dramatically from October. Once sensor experienced a tip count value that exceeded the system-wide mean plus three standard deviations for the month. This sensor was the Justice Center. The data record for this sensor was further inspected.

1. Justice Center (ID 4360)

Overall the series looks reasonable as several periods of rainfall are evident (Figure 1). The majority of rain or possibly snow that melted into the bucket occurred on November 29 and 30.

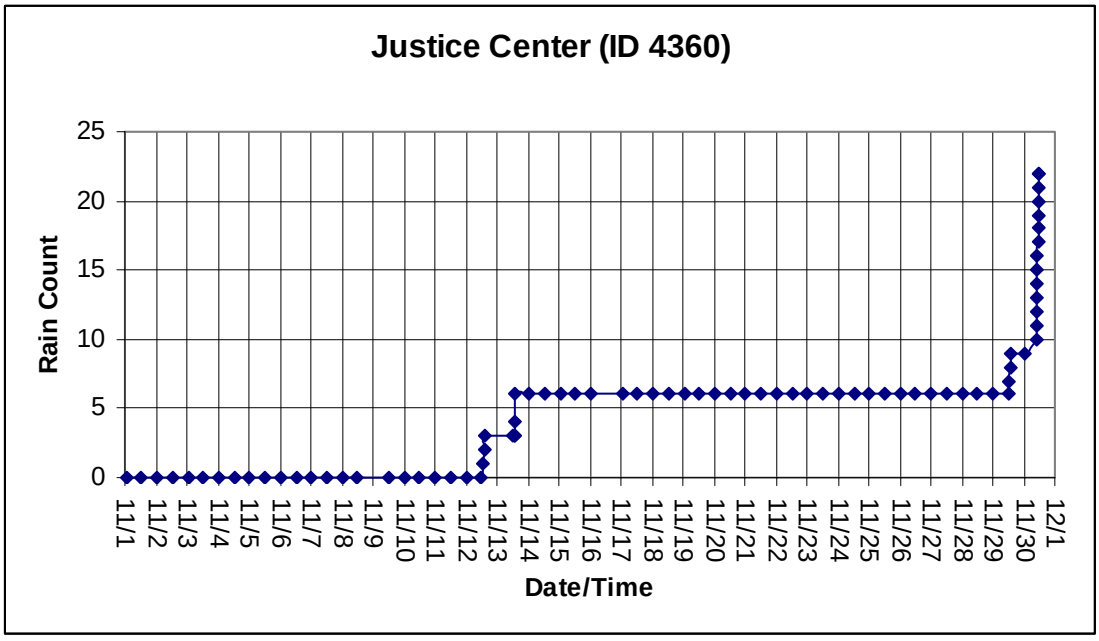


Figure 1. Rain Count Accumulation for Justice Center

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

Two rain sensors experienced a jump in their sequential tip count of more than 6. The tip count series for these sensors is explored in the paragraphs below.

1. Elbert (ID 1440)

On November 3rd, the count series jumps from 180 to 191 in a period of 47 minutes. The large jump is greater than 6 counts but is correctly validated by NovaStar. It is difficult to tell whether this large jump was due to actual rainfall.

Date/Time	Sensor ID	Count
11/1/2006 11:00:38 AM	1440	180
11/1/2006 11:00:40 PM	1440	180
11/2/2006 11:00:39 AM	1440	180
11/2/2006 11:00:41 PM	1440	180
11/3/2006 11:00:39 AM	1440	180
11/3/2006 11:47:05 AM	1440	191
11/3/2006 11:47:20 AM	1440	192
11/3/2006 11:48:38 AM	1440	192
11/3/2006 11:48:49 AM	1440	192
11/3/2006 11:48:57 AM	1440	192
11/3/2006 12:04:19 PM	1440	193
11/3/2006 12:04:33 PM	1440	195
11/3/2006 11:00:41 PM	1440	195

2. Castle Rock (ID 2750)

On November 3rd, the count series jumps from 1643 to 1660 in a period of 3 minutes. The large jump of 17 counts is greater than 6 counts but is validated by NovaStar. It is unlikely that this large jump was due to actual rainfall but rather from the sudden melting of a large volume of snow that had accumulated on the funnel screen.

Date/Time	Sensor ID	Count
11/2/2006 12:26:38 AM	2750	1642
11/2/2006 12:26:40 PM	2750	1642
11/3/2006 12:26:39 AM	2750	1642
11/3/2006 10:45:57 AM	2750	1643
11/3/2006 10:48:12 AM	2750	1643
11/3/2006 10:51:12 AM	2750	1643
11/3/2006 10:59:05 AM	2750	1643
11/3/2006 11:02:25 AM	2750	1660
11/3/2006 11:03:58 AM	2750	1661
11/3/2006 11:04:20 AM	2750	1662
11/3/2006 11:05:12 AM	2750	1663
11/3/2006 12:26:41 PM	2750	1663

C. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing rain tip reports for the month was approximately 85 percent. A total of 312 incrementing reports were received and a total of 368 were expected. The total loss of incrementing reports for the month was approximately 15.22 percent. Those sensors with the worst rain event transmission characteristics are summarized (Table 4).

Table 4. Monthly Summary of Sensors with the Most Missed Tips

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
640	4010	4530	2190	540	4820	4820	2370	1200	1720	1440	
1640	4080	4170	310	1400	1350	2350	2310	4820	330	2750	
4490	4170	4820	4820	1100	4790	2310	220	2340	2340	4810	
-----	-----	-----	-----	4820	2340	750	4060	1530	4820	1640	
-----	-----	-----	-----	1420	2350	150	4180	110	4270	2730	

* Elbert (1440), Castle Rock (2750), Shanahan Ridge (4810), SPR at Union Ave (1640), and Salisbury Park (2730)

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.

Doudy Draw and El Rancho exhibit poor rain event transmission performance for multiple months.

D. Peak Traffic Hour Analysis

The peak hour of radio traffic occurred on 11/14/2006 between 1:00 PM and 2:00 PM. The data for this period was examined more closely to characterize the distribution of sensor transmissions during times of heavy loading (Table 5). During this hour the radio traffic was dominated by wind reports.

Table 5. Peak Traffic Hour Sensor Report Distribution

Sensor Group	Reports	Percent
Wind Speed Average & Azimuth	98	26%
Relative Humidity	53	14%
Wind Gust	53	14%
Water Level PT-HSE	43	11%
Temperature	35	9%
Wind Speed Average	22	6%
Wind Direction	19	5%
Precipitation	12	3%
Water Level Float	9	2%
Battery Voltage HSE	7	2%
Battery Voltage Digital	5	1%
Barometric Pressure	4	1%
Solar Radiation	4	1%
12Hr Status Report	2	1%
Battery Voltage Analog	2	1%
Fuel Moisture	2	1%
Fuel Temperature	2	1%
Battery	1	0%
Precipitation - Mean	1	0%
Total	**374**	

The accuracy of rain data for the peak hour was further analyzed (Table 6) for the District's 1-mm rain sensors. The Hayman gages are not included in the following analysis. No single incrementing tip reports were lost during this peak hour. The rainfall accumulation totals as tracked by NovaStar for the peak hour were accurate. There were no sensors that under-reported rainfall due to the loss of sequential tip counts.

Table 6. Peak Traffic Hour Rain Reporting Summary – Annual Reporting

Heavy Traffic Period	Traffic Msgs/hr	Rain reports expected	Rain reports received	Loss of reports	Accurate rain totals
11/14/06 1:00 PM – 2:00 PM	374	0	0	0	Yes
10/29/06 1:00 AM – 2:00 AM	567	19	19	0.00%	Yes
9/21/06 3:00 AM – 4:00 AM	620	117	114	2.56%	Yes
8/13/06 9:00 PM – 10:00 PM	1,107	346	286	17.34%	Yes

The table above will be used to track the peak hour summary for each month so that over a period of time a correlation can be developed between peak hour loading and loss of single increment reports.

V. Issues Continued from Previous Month

The following issues were identified last month.

1. Doudy Draw (ID 4820) and El Rancho (ID 2340) exhibit poor timer and event transmission performance.

VI. Issues Identified this Month

Further investigation into the following issues is recommended:

1. On November 3rd at 11:00 AM several rain sensors experienced a large jump in their sequential tip count series. These sensors include Elbert (ID 1440) and Castle Rock (ID 2750). Additional quality control should be performed on the historic/archival data series for these sensors to ensure accurate rain totals are available for future analyses.

General System Analysis

Database Name	P:\A207-UDFCD-Data-Analysis\2006_Nov\Novastar_extract_2006Nov.mdb

First Date in Database	11/1/06 12:00 AM	**Total Days**	30.0
Last Date in Database	11/30/06 11:59 PM	**Total Hours**	720.0

Total Records Analyzed 164044

Records by Group

Wind Gust	32968	20%
Relative Humidity	27181	17%
Temperature	25450	16%
Wind Speed Average & Azimuth	18632	11%
Wind Direction	16903	10%
Wind Speed Average	11388	7%
Water Level PT-HSE	8084	5%
Precipitation	4942	3%
Solar Radiation	3394	2%
Battery Voltage HSE	2881	2%
Battery Voltage Digital	2584	2%
Barometric Pressure	2337	1%
Water Level Float	1780	1%
Fuel Moisture	1430	1%
Fuel Temperature	1423	1%
Repeater Pass List	788	0%
Battery Voltage Analog	488	0%
Precipitation - Mean	459	0%
Precipitation - Test	240	0%
Water Level PT	191	0%
12Hr Status Report	115	0%
Longmont Flow Gage	113	0%
Soil Moisture	78	0%
Handar 585 ALARM Status	74	0%
Battery	59	0%
Longmont Water Level PT	58	0%
Solar Power	3	0%
Precipitation-ASCII	1	0%
Total	164044	

Records by Major Group

Meteorologic Sensors	138253	84%
Water Level Sensors	10226	6%
Sensor Status Transmissions	6933	4%
Rain Sensors	4943	3%
Soil and Fuel Sensors	2931	2%
Total	163286	

Records by Validation Type

Good	0	159956	98%
Questionable	1	4088	2%
	Total	164044	

Sensors With Most Invalid Data

Description	**Sensor**	**Reports**
Squaw Mountain	2189	2770
Squaw Mountain	2187	902
Cal-Wood Ranch	4774	34
Sanderson at Xavier	1545	31
Salisbury Park	2724	28

Traffic Loading Summary

Alert Reports	164044	
Average Daily Traffic	5468	
Average Hourly Traffic	228	
Median Hourly Traffic	227	hour beginning
Peak Hourly Traffic	374	11/14/06 1:00 PM

General System Analysis

Reports per Sensor

Description	Sensor	Reports	Fraction of Total
Salisbury Park	2727	3537	2%
Ward C-1	4707	3061	2%
Urban Farm	1464	2817	2%
Urban Farm	1466	2791	2%
Marston Lake North	1526	2771	2%
Squaw Mountain	2189	2770	2%
Urban Farm	1465	2734	2%
Elbert	1439	2676	2%
Castle Rock	2744	2664	2%
Urban Farm	1467	2663	2%
Marston Lake North	1521	2648	2%
Salisbury Park	2724	2629	2%
Squaw Mountain	2187	2617	2%
Castle Rock	2747	2608	2%
Hiwan G.C.	2208	2571	2%
Blue Mountain	138	2537	2%
Quincy Reservoir	751	2524	2%
Ward C-1	4704	2471	2%
Squaw Mountain	2188	2313	1%
Louisville Lake	4744	2253	1%
Sugarloaf	4724	2174	1%
Elbert	1438	2158	1%
Salisbury Park	2732	2116	1%
Louisville Lake	4747	2106	1%
Blue Mountain	139	2023	1%
Highlands Ranch WTP	2704	1980	1%
Diamond Hill	1414	1933	1%
Highlands Ranch WTP	2712	1837	1%
Salisbury Park	2731	1818	1%
Ward C-1	4711	1812	1%
Aurora Reservoir	906	1762	1%
Cal-Wood Ranch	4771	1758	1%
Highlands Ranch WTP	2711	1740	1%
Elbert	1442	1712	1%
Brighton	1921	1699	1%
Brighton	1922	1697	1%
Sugarloaf	4727	1696	1%
Cal-Wood Ranch	4772	1683	1%
Louisville Lake	4751	1671	1%
Marston Lake North	1527	1669	1%
Highlands Ranch WTP	2707	1667	1%
Castle Rock	2751	1662	1%
Hiwan G.C.	2212	1615	1%
Boulder Cr at Broadway	4583	1592	1%
Brighton	1914	1575	1%
Louisville Lake	4752	1553	1%
SPR at Union Ave.	1643	1547	1%
Green Ditch	4593	1543	1%
Blue Mountain	142	1535	1%
Quincy Reservoir	752	1524	1%
Sugarloaf	4732	1502	1%

Rain Timer Performance

Analyze Rain Sensors

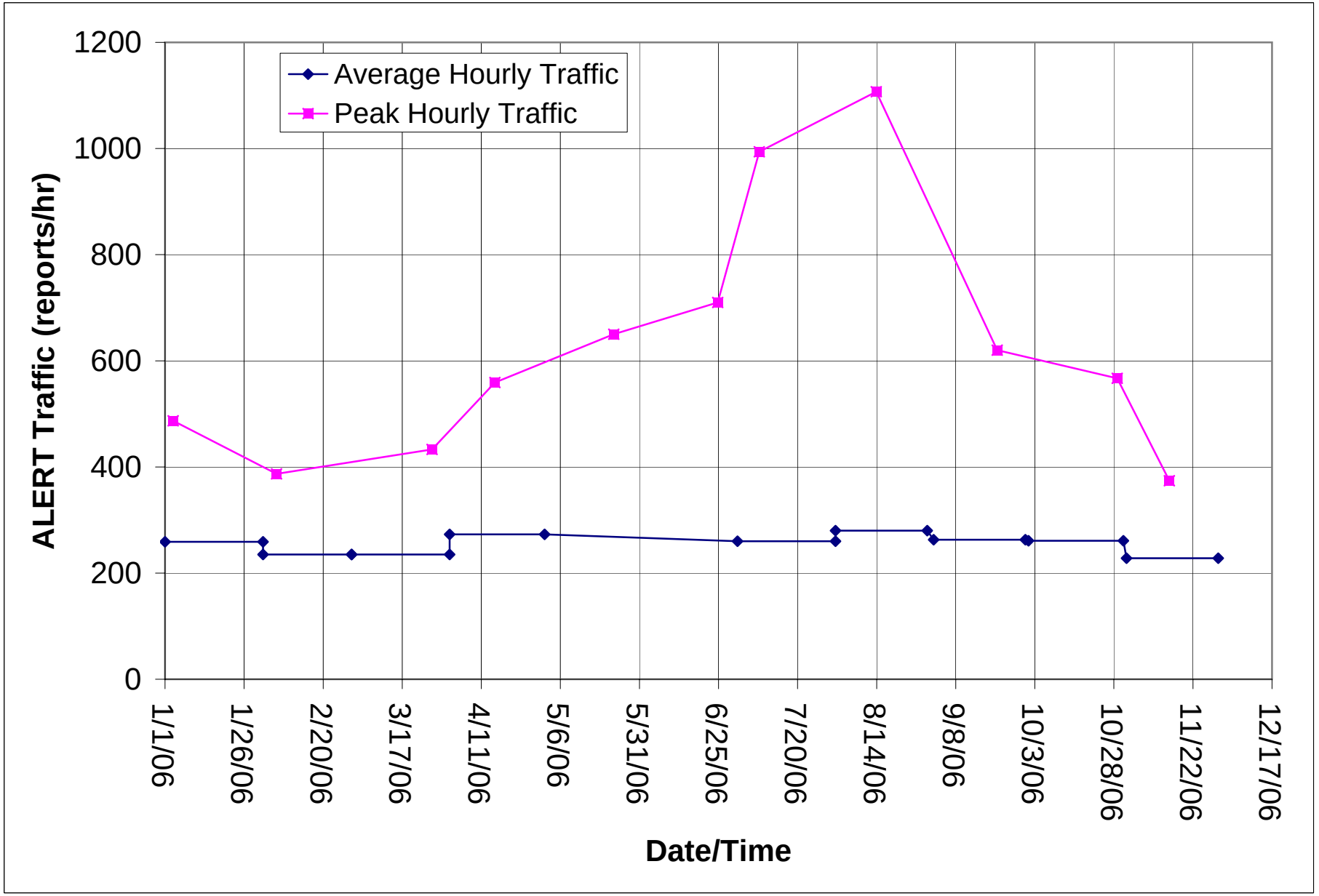
			systemwide average (days) 0.5182		Systemwide Average 93%
Rain Sensors	**Description**	**Received Timer Reports**	**Timer Interval**	**Expected Timer Reports**	**Performance**
140	Blue Mountain	62	11:47	60.00	103%
700	Toll Gate @ 6th	54	12:42	60.00	90%
740	Smoky Hill	58	11:59	60.00	97%
750	Quincy Reservoir	58	12:15	60.00	97%
900	Aurora Reservoir	56	12:47	60.00	93%
1000	Maple Grove Resv.	56	12:38	60.00	93%
1420	Diamond Hill	54	12:56	60.00	90%
1440	Elbert	56	12:54	60.00	93%
1460	Urban Farm	31	23:06	60.00	52%
1480	Third Creek at DIA	64	11:21	60.00	107%
1520	Marston Lake North	59	11:36	60.00	98%
1540	Sanderson at Xavier	57	12:15	60.00	95%
1640	SPR at Union Ave.	58	12:12	60.00	97%
1660	SPR at Henderson	65	10:58	60.00	108%
1700	Cherry Cr @ Champa	57	12:27	60.00	95%
1810	Sand Creek at mouth	58	12:13	60.00	97%
1920	Brighton	58	12:21	60.00	97%
2190	Squaw Mountain	57	12:25	60.00	95%
2210	Hiwan G.C.	57	12:26	60.00	95%
2220	Evergreen Lake	56	12:37	60.00	93%
2330	Morrison	56	12:37	60.00	93%
2710	Highlands Ranch WTP	61	11:50	60.00	102%
2730	Salisbury Park	59	12:12	60.00	98%
2750	Castle Rock	62	11:35	60.00	103%
2820	Haskins Gulch Conf	57	12:29	60.00	95%
4010	Cresent	53	13:22	60.00	88%
4020	Rio Grande	56	12:38	60.00	93%
4030	Red Garden	58	12:26	60.00	97%
4040	Martin Gulch	55	12:39	60.00	92%
4050	Walker Ranch	57	12:11	60.00	95%
4060	Lakeshore	54	13:20	60.00	90%
4070	Bear Peak	58	12:10	60.00	97%
4080	Twin Sisters	43	12:53	60.00	72%
4090	Magnolia	57	12:20	60.00	95%
4100	Filter Plant	57	12:26	60.00	95%
4110	Betasso	58	12:25	60.00	97%
4130	Swiss Peaks	52	13:15	60.00	87%
4140	Logan Mill	53	13:22	60.00	88%
4150	Gold Hill	53	13:09	60.00	88%
4160	Sunshine	58	12:10	60.00	97%
4170	Pine Brook	50	13:59	60.00	83%
4180	Gold Lake	54	13:05	60.00	90%
4190	Slaughterhouse	55	12:51	60.00	92%
4200	Lazy Acres	58	12:04	60.00	97%
4220	Fling's	56	12:37	60.00	93%
4230	Golden Age	59	12:10	60.00	98%
4240	Sunset	49	14:15	60.00	82%
4250	Geer Canyon	57	12:11	60.00	95%
4260	Taylor Mountain	58	12:11	60.00	97%
4270	Cannon Mountain	56	12:25	60.00	93%
4290	Red Hill	58	11:57	60.00	97%
4300	Big Elk Park	58	12:11	60.00	97%
4310	Johnny Park	59	11:57	60.00	98%
4330	Indian Ruins	56	12:37	60.00	93%
4340	Riverside	57	12:25	60.00	95%
4350	Conifer Hill	57	12:24	60.00	95%
4360	Justice Center	57	12:25	60.00	95%
4470	Little Narrows	55	12:49	60.00	92%
4490	Apple Valley	57	12:26	60.00	95%
4510	Pinewood Springs	49	14:02	60.00	82%
4520	Eagle Ridge	60	11:47	60.00	100%
4530	Winiger Ridge	52	13:27	60.00	87%
4560	Lyons Diversion NSV	49	14:20	60.00	82%
4570	St. Antons	53	12:58	60.00	88%
4710	Ward C-1	58	12:12	60.00	97%
4730	Sugarloaf	61	11:24	60.00	102%
4750	Louisville Lake	54	13:12	60.00	90%
4770	Cal-Wood Ranch	59	12:10	60.00	98%
4790	Button Rock	60	11:47	60.00	100%
4810	Shanahan Ridge	54	13:09	60.00	90%
4820	Doudy Draw	51	13:29	60.00	85%
4830	SBC @ San Souci	49	13:47	60.00	82%
4840	SBC@S Boulder Ditch	57	12:39	60.00	95%

Rain Event Performance

Analyze Rain Sensors

		Reports Received	312										
	Systemwide Avg	Total Tips	368										
	91%	Data Loss	15.22%										
Rain Sensor	**Performance**	**1-tip**	**2-tips**	**3-tips**	**4-tips**	**5-tips**	**6-tips**	**> 6 tips**	**Received**	**Expected**	**Missed**	**Hold-off**	**TB size**
140	100%	15	0	0	0	0	0	0	15	15	0	1	0.0393701
700	100%	5	0	0	0	0	0	0	5	5	0	1	0.0393701
740	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
750	100%	6	0	0	0	0	0	0	6	6	0	2	0.0393701
900	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393699
1000	100%	8	0	0	0	0	0	0	8	8	0	1	0.0393701
1420	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
1440	20%	2	1	0	0	0	0	1	3	15	1	2	0.0393701
1460	100%	8	0	0	0	0	0	0	8	8	0	1	0.0393701
1480	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1520	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
1540	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701
1640	50%	1	0	1	0	0	0	0	2	4	2	0	0.0393701
1660	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1700	78%	6	0	1	0	0	0	0	7	9	2	0	0.0393701
1810	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
1920	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
2190	100%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
2210	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
2220	100%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
2320	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
2710	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701
2730	60%	2	0	1	0	0	0	0	3	5	2	0	0.0393701
2750	24%	5	0	0	0	0	0	1	5	21	0	0	0.0393701
2820	83%	4	1	0	0	0	0	0	5	6	1	0	0.0393701
4010	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4020	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4030	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701
4040	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701
4050	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4060	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4070	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4080	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
4090	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4100	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701
4110	60%	5	0	0	0	1	0	0	6	10	4	0	0.0393701
4130	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4140	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4150	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4160	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4170	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4180	100%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
4190	100%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
4200	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4220	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4230	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4240	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4250	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4260	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4270	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4290	100%	9	0	0	0	0	0	0	9	9	0	0	0.0393701
4300	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4310	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4330	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
4340	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4350	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4360	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701
4470	67%	1	1	0	0	0	0	0	2	3	1	0	0.0393701
4490	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4510	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
4520	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701
4530	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
4560	100%	0	0	0	0	0	0	0	0	0	0	0	0.0393701
4570	75%	2	1	0	0	0	0	0	3	4	1	0	0.0393701
4710	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
4730	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4750	100%	4	0	0	0	0	0	0	4	4	0	0	0.0393701
4770	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4790	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701
4810	33%	1	0	1	0	1	0	0	3	9	6	0	0.0393701
4820	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
4830	67%	3	0	1	0	0	0	0	4	6	2	0	0.0393701
4840	100%	9	0	0	0	0	0	0	9	9	0	1	0.0393701
	Total Tips	294	11	5	0	2	0	2	312	368	29	9	

Bucket Tip Data Analysis	
Mean	5.041096
Median	4
Std Deviation	4.230965
Mean + 3 st dev	17.73399
Mean - 3 st dev	-7.651799
Min	0
Max	22


Average Hourly Traffic
Peak Hourly Traffic
ALERT Traffic (reports/hr)
1200
1000
800
600
400
200
0
1/1/06
1/26/06
2/20/06
3/17/06
4/11/06
5/6/06
5/31/06
6/25/06
7/20/06
8/14/06
9/8/06
10/3/06
10/28/06
11/22/06
12/17/06
Date/Time