

Memo

Date: July 8, 2012
To: Kevin Stewart
From: Markus Ritsch
Subject: June 2012 ALERT Data Analysis

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's NovaStar 5.0 base station were analyzed for the period June 1 through June 30, 2012.

II. General System Analysis Summary

A total of 401,549 legacy ALERT data reports were analyzed. Meteorological sensors account for 74 percent, water level sensors 7 percent, and rain sensors 4 percent of the total monthly records.

The system-wide radio traffic loading was 13,385 reports per day with an average hourly loading of 558 reports. The peak hour of radio traffic loading was 1,478 reports, which occurred on June 7th, between 12:00 AM and 1:00 AM. A plot of monthly average and peak hourly traffic loading is provided.

A. Specific Issues Identified this Month

Performance of the following sensors (Table 1) was questionable this month.

Table 1. Rain Sensors with Poor Performance Characteristics

Rain ID	Description	Timer	Event	Comments
1660	SPR at Henderson	32%	0%	Stopped reporting on 6/15/2012
2950	DC Public Works	53%	100%	Transmitter repaired on 6/14/2012
540	Parker/Mississippi	67%	91%	
1710	Shop Creek	70%	90%	
4330	Hansen Rain	70%	75%	Generally poor performance for both timer and event
700	Toll Gate at 6 th	83%	25%	Large gap of missing data from 6/6 – 6/12
2970	Rampart Range Road	66%	67%	Sutron Iridium Satellite Transmitter
400	Montview Park	95%	70%	
3070	Newlin Gulch	93%	68%	
1501, 1502, 1504, 1506, 1507, 1508				A large number of transmissions emanating from Powers Park (1500). OneRain has visited this site toward the end of June so it should be fixed.
939				A large number of unknown transmissions in the 960 ranged. Not sure what these are.
959, 960, 963, 965				Also, unknown ID 4323 is coming from the new Lee Hill rain gage.
4323				

B. Continuous Operation of Base Receiver/Decoder

The ALERT and ALERT2 data feeds on the NS5 base station computer were **NOT** in continuous operation for the entire month. The ALERT2 data feed was down from June 8th through June 11th.

III. Rain Sensor Timer Reporting Summary

The following analysis assumes that each rain sensor has a 12-hour timer-reporting interval. The worst performing rain sensors for the month are summarized (Table 2).

Table 2. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
2320	4550	4270	2890	1710	1660						
1460	1460	4870	1640	2230	2950						
1520	4470	4790	2270	4870	540						
1440	1520	4850	2970	1900	1710						
1000	1440	4570	4490	1660	4330						
4520	140	4070	3010	4330	2320						

*. Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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.

IV. Rain Sensor Event Reporting Summary

A. District-Wide Total Tip/Count Statistics

The incrementing reports from all 1-mm rain sensors were analyzed to quantify the District-wide statistical total monthly tip summary (Table 3). For the months of January, February, March, October, November and December only the stations that operate year-round are included in the rain event analysis. These stations include all weather stations and the stations in Boulder County.

Table 3. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	19.35	Only the 1-mm rain sensors were included in the analysis
Median	9	Only the 1-mm rain sensors were included in the analysis
Standard deviation	23.14	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	88.76	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	ID (Many sites only recorded 1 tip this month)
Maximum total count	124	ID 630 (Temple Pond at DTC – influenced by irrigation)

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 4).

Table 4. 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	9.24	25.08
2009	6.33	3.11	11.37	59.26	63.45	68.00	65.00	20.00	27.29	30.24	11.00	5.60	30.89
2010	5.97	11.90	32.54	70.57	39.63	56.04	50.23	31.01	4.18	18.31	8.30	3.31	27.67
2011	6.78	7.45	7.54	33.94	92.68	39.42	90.87	18.25	37.67	25.73	10.41	13.59	32.03
2012	4.89	13.57	2.35	30.17	38.97	19.35							

*. Only sensors that operate year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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

Several sensors experienced a large jump in the sequential tip count (Table 5).

Table 5. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
Toll Gate at 6 th Avenue	700	Missing a large chunk of data between June 7 th and June 11 th
Newlin Gulch	3070	June 16 th (maintenance work at site that day)
Highland Heritage Park	3090	Erratic data on June 13 th as a result of field work

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 93 percent. A total of 3,110 incrementing reports were received and a total of 3,345 reports were expected. The total loss of incrementing reports for the month was approximately 7 percent. Those sensors with the worst event transmission performance are summarized (Table 6).

Table 6. Monthly Summary of Sensors with the Most Missed Tips

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
1700	2980	2710	4490	2270	700						
1420	3030	4860	2980	4870	2970						
4490	4240	2930	1660	4470	3070						
2980	1520	3030	3010	2980	400						
1660	4490	2990	2320	310	2730						
4090	1420	4050	4470	2280	4330						

*-Only sensors that are operational year-round (weather stations and stations in Boulder County) are included for the analysis in these months.

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.

V. Heavy Radio Traffic Analysis

Periods exceeding 700 messages per hour are analyzed independently in an attempt to quantify data loss rates from rain sensors using their sequential tip count series.

A. The Heaviest Hourly Traffic Periods This Month

The hourly periods of highest radio traffic this month are shown (Table 7). Each hour exceeding 1,000 reports was analyzed to quantify the number of missing rain reports for that hour.

Table 7. Heavy Radio Traffic Periods

Day	Hr	Expected Tips	Received Tips	Total Load	Loss
7	0	397	392	1,478	1.26%
7	1	173	173	1,251	0.00%
6	20	363	339	1,105	6.61%
6	23	240	231	1,104	3.75%

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 8).

Table 8. Summary of Unknown IDs

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	294
Total reports from unknown IDs	11,016
Unknown IDs with only a single received report (potential noise)	220
Total reports from all IDs – RecData Log entire month	401,549
Unknown reports as a fraction of total reports	2.74%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 9) are the total reports received from unknown sensor IDs for each month of the year.

Table 9. Monthly Summary of Total Reports from Unknown IDs

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	1,220	1,474	1,276	1,174	721	5,707	610	1,738	442	533	2,857	6,396
2011	1,231	2,165	3,065	1,254	2,051	439	489	456	191	683	747	861
2012	692	750	1,575	977	5,469	11,016						

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 10).

Table 10. Monthly Percent of Unknown Sensor Reports

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	0.42%	0.56%	0.38%	0.32%	0.20%	1.61%	0.17%	0.49%	0.13%	0.16%	0.93%	1.88%
2011	0.39%	0.73%	0.90%	0.37%	0.58%	0.12%	0.12%	0.05%	0.12%	0.18%	0.22%	0.26%
2012	0.30%	0.25%	0.43%	0.26%	1.37%	2.74%						

Any month shaded in yellow has an excessive number of reports from unknown sensors.

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 11).

Table 11. Reports Received by Unknown IDs

Unknown ID	Total No of Reports
1501	1,796
1502	1,792
1504	1,723
1506	1,698
1507	1,642
1508	1,599
939	198
4323	59
4409	41
965	20
963	19
960	18
959	17
2239	13
799	10

VII. Sensors with Invalid Reports

The following sensors had a large number of invalid reports (bit flip/contention errors/random decode):

Sensor	Description	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1503	Powers Park (level)	0	0	0	1,015						
2813	Pine Cliff Road (level)		9	79	141						
3013	EPC @ Hwy 105 (level)			0	52						
3093	Highland Heritage Park (level)	0	0	0	85						
3090	Highland Heritage Park (Rain)	0	0	0	16						
900	Wx-Aurora Reservoir (Rain)		8	5	16						

VIII. Rainfall Alarms and Intensity Analysis

The following rainfall rate alarms from the Urban Drainage and Flood Control District NovaStar 5.0 Web Server were identified this month.

Urban Drainage and Flood Control District
ALERT Web Server

RAINFALL RATE ALARMS

Historical alarm log: All alarm actions

TYPE and cause	ID/Tag	Name	Date	Time
Rainfall rate alarm	4100	BC Filter Plant	06/28/2012	13:40:59
Rainfall rate alarm	4090	BC Magnolia	06/28/2012	13:28:15
Rainfall rate alarm	4080	BC Twin Sisters	06/28/2012	13:22:20
Rainfall rate alarm	1600	Englewood Dam	06/07/2012	01:09:54
Rainfall rate alarm	2710	Highlands Ranch	06/07/2012	00:48:32
Rainfall rate alarm	1500	Powers Park	06/07/2012	00:47:47
Rainfall rate alarm	2710	Highlands Ranch	06/07/2012	00:36:37
Rainfall rate alarm	1340	Sanderson at Xa	06/07/2012	00:30:23
Rainfall rate alarm	1350	Chatfield COE	06/07/2012	00:30:15
Rainfall rate alarm	1530	Bear Creek @ Lo	06/07/2012	00:27:33
Rainfall rate alarm	1350	Chatfield COE	06/07/2012	00:26:15
Rainfall rate alarm	1520	Marston Lake No	06/07/2012	00:23:34
Rainfall rate alarm	1530	Bear Creek @ Lo	06/07/2012	00:21:20
Rainfall rate alarm	1520	Marston Lake No	06/07/2012	00:19:04
Rainfall rate alarm	1370	West Metro FS13	06/07/2012	00:16:15
Rainfall rate alarm	720	Confluence Pond	06/06/2012	23:43:43
Rainfall rate alarm	2960	Indian Creek	06/06/2012	22:26:43
Rainfall rate alarm	2960	Indian Creek	06/06/2012	22:24:07
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	21:02:25
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	21:00:27
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	21:00:27
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	20:57:11
Rainfall rate alarm	940	Sampson Gulch	06/06/2012	20:54:58
Rainfall rate alarm	2730	Salisbury Park	06/06/2012	20:52:56
Rainfall rate alarm	2840	Sulphur Gulch	06/06/2012	20:36:56
Rainfall rate alarm	2840	Sulphur Gulch	06/06/2012	20:35:06
Rainfall rate alarm	2730	Salisbury Park	06/06/2012	20:33:16
Rainfall rate alarm	2860	Cherry at Stroh	06/06/2012	20:12:06
Rainfall rate alarm	2860	Cherry at Stroh	06/06/2012	20:11:02
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	20:09:58
Rainfall rate alarm	2820	Haskins Gulch C	06/06/2012	20:09:28

General System Analysis

Database Name

P:\A207-UDFCD-Data-Analysis\2012\06-2012\Novastar_extract_2012Jun.mdb

First Date in Database

6/1/12 12:00 AM

Total Days

30.0

Last Date in Database

6/30/12 11:59 PM

Total Hours

720.0

Total Records Analyzed

401,549

Records by Group

Wind Data	141,379	35%
Temperature	67,869	17%
Relative Humidity	59,347	15%
Barometric Pressure	30,287	8%
Water Level	27,800	7%
Battery Voltage	20,526	5%
Precipitation	14,757	4%
Unknown IDs	11,016	3%
Solar Radiation	9,612	2%
Fuel Temperature	5,738	1%
Fuel Moisture	5,728	1%
Soil Moisture	2,843	1%
Repeater Status Report	2,424	1%
Flasher Status	705	0%
Repeater Pass List	595	0%
12Hr Status Report	487	0%
Hayman Battery	375	0%
Handar 585 ALARM Status	60	0%
Dewpoint Temperature	1	0%
Total	401,549	

Records by Major Group

Meteorologic Sensors	298,882	74%
Water Level Sensors	27,800	7%
Rain Sensors	14,757	4%
Soil and Fuel Sensors	14,309	4%
Sensor Status Transmissions	3,566	1%
Total	359,314	

Traffic Loading Summary

Alert Reports	401,549	
Average Daily Traffic	13,385	
Average Hourly Traffic	558	
Median Hourly Traffic	537	hour beginning
Peak Hourly Traffic	1,478	Jun 7, 12:00 AM
2nd Max	1,251	Jun 7, 1:00 AM
3rd Max	1,105	Jun 6, 8:00 PM
4th Max	1,104	Jun 6, 11:00 PM
5th Max	934	Jun 7, 2:00 AM

Rain Timer Performance

Analyze Rain Sensors

Rain ID	Description	Rcv	Timer	Exp	Performance
1660	SPR at Henderson	19	18:21	60	32%
2950	DC Public Works	32	12:00	60	53%
540	Parker/Mississippi	40	17:16	60	67%
1710	Shop Creek	42	15:20	60	70%
4330	Hansen Rain	42	16:15	60	70%
2320	Choke Cherry Resvr	43	16:30	60	72%
2240	Cold Sprg Glch conf	46	14:44	60	77%
2270	Cub Cr below Blue	46	15:02	60	77%
2790	W. Cherry Creek Wx	47	6:05	60	78%
4470	Little Narrows	47	14:28	60	78%
4510	Pinewood Springs	47	14:08	60	78%
4850	Porphyry Mtn	48	13:27	60	80%
2230	Bear Cr below Cub	49	14:12	60	82%
4150	Gold Hill	49	14:24	60	82%
4240	Sunset	49	13:16	60	82%
310	Guy Hill Ranch	50	13:17	60	83%
700	Toll Gate @ 6th	50	11:44	60	83%
1100	Louisville Rec Ctr	50	14:11	60	83%
1110	Gunbarrel	50	13:44	60	83%
2810	Pine Cliff Road	50	12:16	60	83%
2960	Indian Creek	50	13:36	60	83%
4220	Fling's	50	14:08	60	83%
4570	St. Antons	50	13:46	60	83%
520	Jewell Detention	51	12:33	60	85%
2800	Columbine Open Space	51	13:45	60	85%
4010	Crescent	51	13:12	60	85%
4270	Cannon Mountain	51	13:31	60	85%
2940	Willow Creek - DougCnty	52	13:13	60	87%
4550	Boulder Jail	52	13:40	60	87%
4870	SBC @ SB Road	52	12:14	60	87%
150	Nott Creek	53	12:12	60	88%
1340	Sanderson at Xavier	53	13:10	60	88%
2980	Dakan Rd	53	13:11	60	88%
2990	Wx-Tomah Rd-DougCnty	53	13:24	60	88%
3010	EPC at Hwy 105	53	13:26	60	88%
4080	Twin Sisters	53	13:12	60	88%
4090	Magnolia	53	12:59	60	88%
4100	Filter Plant	53	13:27	60	88%
4140	Logan Mill	53	12:56	60	88%
4230	Golden Age	53	13:24	60	88%
4320	Lee Hill Rain 2012	53	12:42	60	88%
4710	Wx-Ward C-1	53	13:15	60	88%
810	Granby Ditch @ 6th	54	12:41	60	90%
1030	NREL/S. Table Mtn.	54	12:53	60	90%
1060	Heritage Square	54	12:55	60	90%
1460	Wx-Urban Farm	54	12:44	60	90%
2820	Haskins Gulch Conf	54	12:58	60	90%
2850	Cherry Cr bl Bayou Glch	54	13:12	60	90%
2890	Spruce Mt - Douglas	54	12:42	60	90%
2920	West Cherry Head-Douglas Cnty	54	13:10	60	90%
4170	Pine Brook	54	12:58	60	90%
4190	Slaughterhouse	54	12:55	60	90%
4490	Apple Valley	54	12:41	60	90%
4530	Winiger Ridge	54	12:55	60	90%

4860	Fairview Peak	54	12:44	60	90%
4880	Whispering Pines	54	12:26	60	90%
220	Upper Leyden	55	12:41	60	92%
420	Expo Park	55	12:45	60	92%
430	Utah Park	55	11:57	60	92%
600	Harvard Gulch Park	55	12:52	60	92%
630	Temple Pond at DTC	55	12:21	60	92%
830	Side Creek Park	55	12:41	60	92%
1310	LDC at 64th	55	12:39	60	92%
1520	Wx-Marston Lake North	55	12:56	60	92%
2310	Genesee Village	55	12:53	60	92%
2730	Wx-Salisbury Park	55	12:36	60	92%
2870	Cottonwood (Apache)	55	12:00	60	92%
2930	Wx-Spring Valley Rd-DougCnty	55	12:53	60	92%
3030	WX-Bingham Lake Park	55	12:46	60	92%
4130	Swiss Peaks	55	12:56	60	92%
4340	Riverside	55	12:39	60	92%
4790	Wx-Button Rock	55	12:28	60	92%
200	Leyden Reservoir	56	12:37	60	93%
710	Horseshoe Park Drop	56	12:41	60	93%
750	Wx-Quincy Reservoir	56	12:12	60	93%
870	Murphy Creek GC	56	12:42	60	93%
1000	Maple Grove Resv.	56	12:11	60	93%
1010	Denver West	56	12:37	60	93%
1330	Roslyn	56	12:40	60	93%
1400	Upper Sloan Det.	56	12:24	60	93%
1530	Bear Creek @ Lowell	56	12:37	60	93%
1700	Cherry Cr @ Champa	56	12:13	60	93%
1720	Cherry Cr @ Steele	56	12:40	60	93%
1810	Sand Creek at mouth	56	12:38	60	93%
2370	Red Rocks Park	56	12:26	60	93%
2860	CC at Stroh Rd	56	12:25	60	93%
2910	East Cherry Cr-Douglas	56	12:27	60	93%
3050	East/West Trailhead	56	12:00	60	93%
3070	Newlin Gulch	56	11:47	60	93%
3080	Tallman Gulch	56	12:40	60	93%
4020	Rio Grande	56	12:25	60	93%
4070	Bear Peak	56	12:39	60	93%
4160	Sunshine	56	12:38	60	93%
4770	Wx-Cal-Wood Ranch	56	12:27	60	93%
330	Van Bibber @ Hwy 93	57	12:24	60	95%
400	Montview Park	57	12:24	60	95%
410	Kelly Dam	57	12:25	60	95%
500	Havana Park	57	12:15	60	95%
650	Iliff Pond	57	12:11	60	95%
730	No Name @ Quincy	57	11:57	60	95%
1040	Lena @ U.S. Hwy 6	57	12:26	60	95%
1050	Jeffco Fairgrounds	57	12:11	60	95%
1200	Broomfield 3207	57	12:24	60	95%
1320	SPR at 3rd Ave	57	12:10	60	95%
1370	West Metro FS13	57	12:11	60	95%
1440	Wx-Elbert	57	12:00	60	95%
1480	Third Creek at DIA	57	12:11	60	95%
1550	Lakewood CC	57	12:19	60	95%
1570	Wx-Brighton Ditch	57	12:15	60	95%
1900	Niver Detention	57	12:24	60	95%
2190	Wx-Squaw Mountain	57	12:13	60	95%
2750	Wx-Castle Rock	57	12:00	60	95%
3060	Fire Sta 47	57	12:28	60	95%

4060	Lakeshore	57	12:25	60	95%
4110	Betasso	57	12:25	60	95%
4360	Justice Center	57	12:25	60	95%
4750	Wx-Louisville Lake	57	12:25	60	95%
110	Ralston Reservoir	58	11:58	60	97%
120	West Woods	58	12:10	60	97%
140	Wx-Blue Mountain	58	12:00	60	97%
210	Leyden Confluence	58	11:58	60	97%
300	Van Bibber Park	58	12:10	60	97%
510	Virginia Court	58	11:57	60	97%
530	Fire Station #19	58	12:11	60	97%
620	Quincy/Highline	58	12:11	60	97%
820	ETG @ Buckley	58	12:24	60	97%
840	Fire Station 12	58	12:00	60	97%
850	Flying J	58	12:00	60	97%
970	Pump Sta 3	58	12:00	60	97%
1350	Chatfield COE	58	11:59	60	97%
1360	Denver Zoo	58	12:12	60	97%
1420	Wx-Diamond Hill	58	12:12	60	97%
2840	Sulphur Gulch	58	12:13	60	97%
2880	Happy Canyon at N Surrey Dr	58	12:13	60	97%
2900	Russelville Gulch-Douglas	58	12:00	60	97%
3020	Wx-West Creek WX	58	12:12	60	97%
3040	CC @ Prairie Canyon Ranch	58	12:12	60	97%
4200	Lazy Acres	58	12:13	60	97%
4260	Taylor Mountain	58	12:10	60	97%
4730	Wx-Sugarloaf	58	12:13	60	97%
320	Sports Complex	59	11:57	60	98%
760	Mission Viejo Park	59	11:57	60	98%
920	Wx-Aurora Town Hall	59	12:00	60	98%
1300	Hidden Lake	59	11:58	60	98%
1620	Slaughterhouse Glch	59	11:58	60	98%
1800	Sand Creek Park	59	11:57	60	98%
1920	Wx-Brighton	59	12:00	60	98%
2710	Wx-Highlands Ranch WTP	59	11:48	60	98%
4290	Red Hill	59	11:45	60	98%
4520	Eagle Ridge	59	12:00	60	98%
440	Fire Station #7	60	11:57	60	100%
720	Confluence Pond	60	11:58	60	100%
1500	Powers Park	60	11:38	60	100%
4180	Gold Lake	60	11:45	60	100%
860	Sand Cr at Colfax	61	12:00	60	102%
4350	Conifer Hill	62	11:33	60	103%
1600	Englewood Dam	63	11:44	60	105%
950	Piney at Liverpool	64	11:44	60	107%
800	Sable Ditch @ 18th	65	10:47	60	108%
4310	Johnny Park	65	10:13	60	108%
2350	Idledale	66	10:36	60	110%
610	Harvard @ Jackson	67	10:24	60	112%
2360	Indian Hills	69	9:54	60	115%
4250	Geer Canyon	69	9:45	60	115%
4300	Big Elk Park	70	10:00	60	117%
2250	Rosedale	73	9:52	60	122%
4830	SBC @ San Souci	73	9:45	60	122%
640	Goldsmith @ Eastman	74	8:26	60	123%
2210	Wx-Hiwan G.C.	75	9:21	60	125%
2340	El Rancho	76	9:15	60	127%
4820	Doudy Draw	77	9:04	60	128%
2260	Brook Forest	80	8:44	60	133%

4050	Walker Ranch	82	8:09	60	137%
2280	Kinney Peak	84	8:45	60	140%
4840	SBC@S Boulder Ditch	84	8:35	60	140%
4810	Shanahan Ridge	85	8:21	60	142%
4040	Martin Gulch	87	7:38	60	145%
2330	Morrison	89	8:40	60	148%
4030	Red Garden	95	7:21	60	158%
900	Wx-Aurora Reservoir	130		60	217%
940	Sampson Gulch	251		60	418%
3090	Highland Heritage Park	173		60	288%
5720	Four Mile Creek	34	18:00	60	57%
5730	West Creek	59	12:00	60	98%
5740	Trail Creek	55	12:53	60	92%
5810	Stump Bump	59	12:00	60	98%
5860	Cedar Mountain	53	13:24	60	88%
5880	Hackett Mountain	56	12:40	60	93%
5940	Log Jumper	51	13:31	60	85%

Rain Event Performance			Reports Received	3,110	Analyze Rain Sensors										
		Systemwide Avg	Total Tips	3,345											
		92.97%	Data Loss	7.03%											
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket	
Toll Gate @ 6th	700	25%	6	0	0	0	0	0	0	1	6	24	18	0	0.0393701
Rampart Range Rd	2970	67%	12	0	0	1	1	0	0	0	14	21	7	0	0.0393701
Newlin Gulch	3070	68%	31	5	1	0	1	0	0	1	38	56	18	0	0.0393701
Montview Park	400	70%	5	1	1	0	0	0	0	0	7	10	3	0	0.0393701
Wx-Salisbury Park	2730	74%	25	4	1	0	0	0	1	0	31	42	11	1	0.0393701
Hansen Rain	4330	75%	4	2	0	0	0	0	0	0	6	8	2	0	0.0393701
Cold Sprg Glch conf	2240	75%	2	1	0	0	0	0	0	0	3	4	1	0	0.0393701
SBC @ SB Road	4870	75%	2	1	0	0	0	0	0	0	3	4	1	0	0.0393701
Whispering Pines	4880	75%	2	1	0	0	0	0	0	0	3	4	1	0	0.0393701
Cherry Cr @ Champa	1700	80%	6	2	0	0	0	0	0	0	8	10	2	0	0.0393701
Betasso	4110	80%	3	1	0	0	0	0	0	0	4	5	1	0	0.0393701
Bear Cr below Cub	2230	82%	7	2	0	0	0	0	0	0	9	11	2	0	0.0393701
Slaughterhouse Glch	1620	82%	22	6	0	0	0	0	0	0	28	34	6	0	0.0393701
Kinney Peak	2280	83%	33	4	0	0	1	0	0	0	38	46	8	0	0.0393701
Kelly Dam	410	83%	9	0	1	0	0	0	0	0	10	12	2	0	0.0393701
West Cherry Head-Doug	2920	83%	4	1	0	0	0	0	0	0	5	6	1	0	0.0393701
Quincy/Highline	620	86%	15	3	0	0	0	0	0	0	18	21	3	0	0.0393701
Dakan Rd	2980	86%	5	1	0	0	0	0	0	0	6	7	1	0	0.0393701
Jewel Detention	520	86%	16	3	0	0	0	0	0	0	19	22	3	0	0.0393701
Wx-Quincy Reservoir	750	87%	36	4	1	0	0	0	0	0	41	47	6	0	0.0393701
Swiss Peaks	4130	88%	6	1	0	0	0	0	0	0	7	8	1	0	0.0393701
Pine Brook	4170	88%	6	1	0	0	0	0	0	0	7	8	1	0	0.0393701
Fire Station #19	530	88%	13	2	0	0	0	0	0	0	15	17	2	0	0.0393701
Magnolia	4090	88%	13	2	0	0	0	0	0	0	15	17	2	0	0.0393701
Bear Creek @ Lowell	1530	88%	40	6	0	0	0	0	0	0	46	52	6	0	0.0393701
Sand Cr at Colfax	860	88%	20	3	0	0	0	0	0	0	23	26	3	0	0.0393701
Horseshoe Park Drop	710	89%	21	3	0	0	0	0	0	0	24	27	3	0	0.0393701
East Cherry Cr-Douglas	2910	89%	7	1	0	0	0	0	0	0	8	9	1	0	0.0393701
Haskins Gulch Conf	2820	89%	79	9	1	0	0	0	0	0	89	100	11	0	0.0393701
Wx-Aurora Reservoir	900	89%	43	6	0	0	0	0	0	0	49	55	6	0	0.0393699
Happy Canyon at N Surre	2880	89%	46	4	1	0	0	0	0	0	51	57	6	0	0.0393701
Iliff Pond	650	89%	16	0	1	0	0	0	0	0	17	19	2	0	0.0393701
Side Creek Park	830	90%	23	3	0	0	0	0	0	0	26	29	3	0	0.0393701
Indian Creek	2960	90%	39	5	0	0	0	0	0	0	44	49	5	0	0.0393701
Wx-Urban Farm	1460	90%	8	1	0	0	0	0	0	0	9	10	1	0	0.0393701
St. Antons	4570	90%	8	1	0	0	0	0	0	0	9	10	1	0	0.0393701
Shop Creek	1710	90%	34	4	0	0	0	0	0	0	38	42	4	0	0.0393701
Highland Heritage Park	3090	90%	45	11	0	0	1	0	0	9	57	63	6	1	0.0393701
Sulphur Gulch	2840	91%	55	4	1	0	0	0	0	0	60	66	6	0	0.0393701
Confluence Pond	720	91%	28	1	1	0	0	0	0	0	30	33	3	0	0.0393701
Parker/Mississippi	540	91%	18	2	0	0	0	0	0	0	20	22	2	0	0.0393701
West Metro FS13	1370	91%	29	3	0	0	0	0	0	0	32	35	3	0	0.0393701
Morrison	2330	92%	30	3	0	0	0	0	0	0	33	36	3	0	0.0393701
Pine Cliff Road	2810	92%	21	0	1	0	0	0	0	0	22	24	2	0	0.0393701
Guy Hill Ranch	310	92%	10	1	0	0	0	0	0	0	11	12	1	0	0.0393701
Twin Sisters	4080	93%	12	1	0	0	0	0	0	0	13	14	1	0	0.0393701
CC at Stroh Rd	2860	93%	76	6	0	0	0	0	0	0	82	88	6	0	0.0393701
East/West Trailhead	3050	93%	51	4	0	0	0	0	0	0	55	59	4	0	0.0393701
Sand Creek Park	1800	93%	13	1	0	0	0	0	0	0	14	15	1	0	0.0393701
Virginia Court	510	94%	29	2	0	0	0	0	0	0	31	33	2	0	0.0393701
Fire Station #7	440	94%	15	1	0	0	0	0	0	0	16	17	1	0	0.0393701
Wx-Squaw Mountain	2190	94%	15	1	0	0	0	0	0	0	16	17	1	1	0.0393701
Red Rocks Park	2370	94%	15	1	0	0	0	0	0	0	16	17	1	0	0.0393701
Cottonwood (Apache)	2870	94%	31	2	0	0	0	0	0	0	33	35	2	0	0.0393701
Piney at Liverpool	950	94%	32	2	0	0	0	0	0	0	34	36	2	0	0.0393701
Cub Cr below Blue	2270	94%	16	1	0	0	0	0	0	0	17	18	1	0	0.0393701
Cherry Cr bl Bayou Glch	2850	95%	35	2	0	0	0	0	0	0	37	39	2	0	0.0393701
WX-Bingham Lake Park	3030	95%	71	4	0	0	0	0	0	0	75	79	4	0	0.0393701
Fire Station 12	840	95%	19	1	0	0	0	0	0	0	20	21	1	0	0.0393701
Lakewood CC	1550	95%	40	2	0	0	0	0	0	0	42	44	2	0	0.0393701
Chatfield COE	1350	96%	44	2	0	0	0	0	0	0	46	48	2	0	0.0393701
Harvard @ Jackson	610	96%	22	1	0	0	0	0	0	0	23	24	1	0	0.0393701
Granby Ditch @ 6th	810	96%	22	1	0	0	0	0	0	0	23	24	1	0	0.0393701
Pump Sta 3	970	96%	45	2	0	0	0	0	0	0	47	49	2	0	0.0393701
Goldsmith @ Eastman	640	96%	50	2	0	0	0	0	0	0	52	54	2	0	0.0393701
Sable Ditch @ 18th	800	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.0393701
Mission Viejo Park	760	97%	30	1	0	0	0	0	0	0	31	32	1	0	0.0393701
Sanderson at Xavier	1340	97%	34	1	0	0	0	0	0	0	35	36	1	0	0.0393701
Expo Park	420	97%	37	1	0	0	0	0	0	0	38	39	1	0	0.0393701
Temple Pond at DTC	630	98%	119	1	1	0	0	0	0	0	121	124	3	1	0.0393701
Wx-Aurora Town Hall	920	98%	40	1	0	0	0	0	0	0	41	42	1	0	0.0393701
Utah Park	430	98%	92	2	0	0	0	0	0	0	94	96	2	0	0.0393701
Fire Sta 47	3060	98%	93	2	0	0	0	0	0	0	95	97	2	0	0.0393701
Wx-Marston Lake North	1520	98%	50	1	0	0	0	0	0	0	51	52	1	2	0.0393701
Wx-Highlands Ranch W	2710	98%	51	1	0	0	0	0	0	0	52	53	1	0	0.0393701

Powers Park	1500	99%	97	1	0	0	0	0	0	0	98	99	1	2	0.0393701
Havana Park	500	100%	53	0	0	0	0	0	0	0	53	53	0	0	0.0393701
Sampson Gulch	940	100%	47	0	0	0	0	0	0	0	47	47	0	0	0.0393699
Flying J	850	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701
Englewood Dam	1600	100%	37	0	0	0	0	0	0	0	37	37	0	0	0.0393701
No Name @ Quincy	730	100%	29	0	0	0	0	0	0	0	29	29	0	0	0.0393701
Harvard Gulch Park	600	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.0393701
Murphy Creek GC	870	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701
ETG @ Buckley	820	100%	17	0	0	0	0	0	0	0	17	17	0	0	0.0393701
Wx-Brighton Ditch	1570	100%	16	0	0	0	0	0	0	0	16	16	0	0	0.0393701
Wx-Ward C-1	4710	100%	15	0	0	0	0	0	0	0	15	15	0	0	0.0393701
Wx-Blue Mountain	140	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Brook Forest	2260	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Upper Sloan Det.	1400	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701
Indian Hills	2360	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701
SPR at 3rd Ave	1320	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701
Filter Plant	4100	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701
Gold Hill	4150	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701
Wx-Button Rock	4790	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701
Wx-Elbert	1440	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
Third Creek at DIA	1480	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
Wx-Sugarloaf	4730	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
Denver West	1010	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Wx-Hiwan G.C.	2210	100%	8	0	0	0	0	0	0	0	8	8	0	1	0.0393701
Rosedale	2250	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Slaughterhouse	4190	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Winiger Ridge	4530	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Maple Grove Resv.	1000	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Jeffco Fairgrounds	1050	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Cherry Cr @ Steele	1720	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Golden Age	4230	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Big Elk Park	4300	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Ralston Reservoir	110	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Nott Creek	150	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Bear Peak	4070	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Logan Mill	4140	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Lazy Acres	4200	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Fling's	4220	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Taylor Mountain	4260	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Little Narrows	4470	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
SBC@S Boulder Ditch	4840	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Russelville Gulch-Dougla	2900	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Crescent	4010	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Rio Grande	4020	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Sunshine	4160	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Lee Hill Rain 2012	4320	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Conifer Hill	4350	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Justice Center	4360	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Pinewood Springs	4510	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Sports Complex	320	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Van Bibber @ Hwy 93	330	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Lena @ U.S. Hwy 6	1040	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Gunbarrel	1110	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Hidden Lake	1300	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Denver Zoo	1360	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Idledale	2350	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Walker Ranch	4050	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Lakeshore	4060	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Gold Lake	4180	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Wx-Cal-Wood Ranch	4770	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Leyden Confluence	210	100%	3	0	0	0	0	0	0	0	3	3	0	1	0.0393701
Upper Leyden	220	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Heritage Square	1060	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
LDC at 64th	1310	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Wx-Diamond Hill	1420	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Sand Creek at mouth	1810	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Genesee Village	2310	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
DC Public Works	2950	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Martin Gulch	4040	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Sunset	4240	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Cannon Mountain	4270	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Johnny Park	4310	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Apple Valley	4490	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Eagle Ridge	4520	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Van Bibber Park	300	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
NREL/S. Table Mtn.	1030	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
Broomfield 3207	1200	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
Choke Cherry Resvr	2320	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
El Rancho	2340	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
Wx-Castle Rock	2750	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701

Columbine Open Space	2800	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Willow Creek - DougCnty	2940	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Geer Canyon	4250	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Red Hill	4290	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Riverside	4340	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Boulder Jail	4550	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
SBC @ San Souci	4830	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Roslyn	1330	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
SPR at Union Ave.	1640	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Niver Detention	1900	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Spruce Mt - Douglas	2890	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Wx-Tomah Rd-DougCnty	2990	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Wx-West Creek WX	3020	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
CC @ Prairie Canyon Ra	3040	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Tallman Gulch	3080	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Red Garden	4030	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Shanahan Ridge	4810	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Doudy Draw	4820	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
		TOTAL TIPS								3110	3345			
EPC at Hwy 105	3010	100%	2	0	0	0	0	0	0	2	2	0	0	0.01
Porphory Mtn	4850	90%	35	2	1	0	0	0	0	38	42	4	7	0.01
Fairview Peak	4860	94%	28	2	0	0	0	0	0	30	32	2	0	0.01
Four Mile Creek	5720	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
West Creek	5730	100%	3	0	0	0	0	0	0	3	3	0	0	0.0393701
Stump Bump	5810	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701
Cedar Mountain	5860	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701
Hackett Mountain	5880	100%	1	0	0	0	0	0	0	1	1	0	0	0.0393701
Log Jumper	5940	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701

2012 Monthly ALERT Radio Traffic Summary

