

Memo

Date: March 12, 2014
To: Kevin Stewart
From: Markus Ritsch
Subject: February 2014 ALERT Data Analysis

I. ALERT Data Source

Raw ALERT data records extracted from the Urban Drainage and Flood Control District's NovaStar 5 base station were analyzed for the period February 1 through February 28, 2014.

II. General System Analysis Summary

In 2014 data will be received at the District through both the legacy ALERT channel and through the ALET2 (concentrator plus A2 self-reports) channel. The following table quantifies the data reception through each telemetry source. The West Creek repeater in Douglas County processes both incoming data on A1 and A2 but passes on only A2 format messages to Diamond Hill. All other repeaters in the system send data on both legacy and A2 channels.

Table 1. Reception of A1/A2 Data at Diamond Hill

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Legacy	320,303	214,698										
Concentrator	508,306	370,222										
ALERT2	129,855	86,506										
TOTAL	958,464	671,426	0	0	0	0	0	0	0	0	0	0
Conc+A2	638,161	456,728										
Conc/Leg	1.59	1.72										
DataChron	498,846	444,211										

The daily ratio of ALERT2 reports received versus legacy ALERT reports received is shown (Figure 1). In early February the ratio of A2 to legacy reports is high. This corresponds to a cold spell where the average daily temperature during the first week in February was below freezing. The Blue Mountain repeater does not forward legacy ALERT reports when the temperature is below freezing. This results in a relative increase in data concentrator reports which drives up the ratio.

On February 20th the collection of both legacy ALERT and A2 reports was down as the VM server was undergoing OS upgrades. The NS5 software was restarted on February 21st after the OS upgrades were complete.

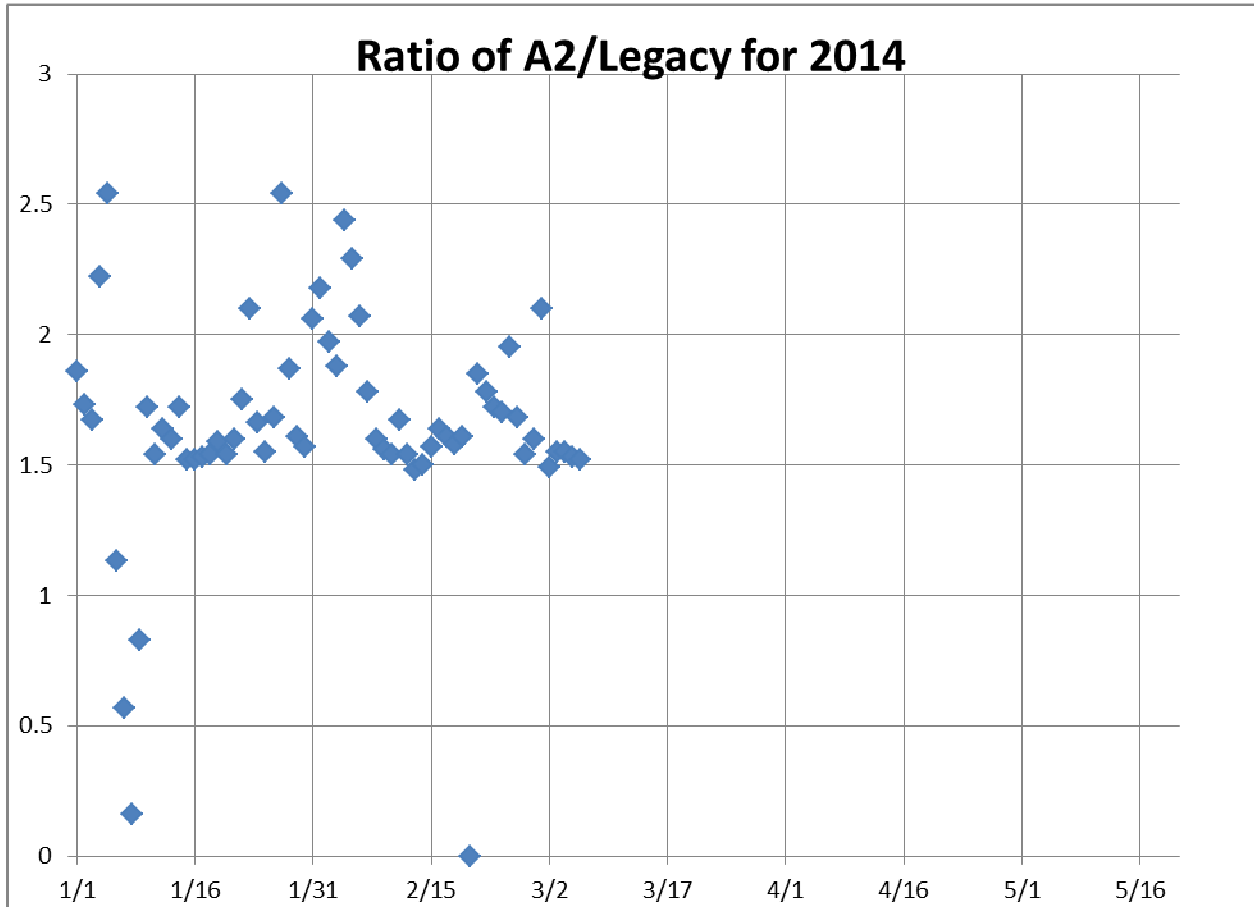


Figure 1. Daily Ratio of ALERT2/Legacy Reports

A. Continuous Operation of Base Receiver/Decoder

The NS5 base station was **NOT** in continuous operation for the entire month. The NS5 base was down from Feb 20th at 4:00 PM to Feb 21st at 9:00 AM. The District was making upgrades to the VM server at this time and the NS5 base station was not operational during this period. The NS5 base was back in full operation beginning February 21st at 10:00 AM for the remainder of the month.

B. Specific Issues Identified this Month

Performance of the following sensors (Table 2) was questionable this month.

Table 2. Sensors with Poor Performance Characteristics

Sensor ID	Description	Timer	Event	Comments
4470	Little Narrows	50	89	
2710	Highlands Ranch WTP	29	100	
2730	WX-Salisbury Park	57	67	
4550	Boulder Jail	68	100	
2790	W. Cherry Creek Weather Station – Sending bad data – WET to investigate			

C. Performance of New A2 Sites

Currently there are only a handful of remote sites operating on the new A2 protocol. The “**event**” performance of these sites is tracked throughout the 2014 flood season in the table below.

Table 3. Event Performance of New A2 Sites (percent)

Description	ID	Install Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug*	Sep*	Oct	Nov	Dec
Heritage Regional Park	3090	03/14/2013	n/a	n/a										
ETG @ Hampden	100110	05/01/2013	n/a	n/a										
Blackstone	100100	05/03/2013	n/a	n/a										
Newlin Gulch	3070	05/24/2013	100	83										
Carr Street	100	05/31/2013	n/a	n/a										
Maple Grove	1000	05/20/2013	100	90										
Haystack Road	100150	02/26/2014	n/a	n/a										
New site 2014														
New site 2014														
New site 2014														
New site 2014														
New site 2014														

Only two A2 self-reporting sites remain operational over the winter and they are Newlin Gulch and Maple Grove Reservoir. An inconsistency in the A2 self-report data reception was noticed this month between the Contrail base and the NS5 base at Diamond Hill. Dave Leader was made aware of this issue (see the email thread below).

From: David Leader [mailto:DLeader@hydrolynx.com]

Sent: Tuesday, March 11, 2014 2:23 PM

To: Markus Ritsch

Cc: Rob Niedenzu

Subject: RE: A2 Self Report Data Reception at District

Markus,

Yes it should be the same unless something goes wrong with the data collection or incremental rain computation. Both servers missed reports. The 0.12 increment for NovaStar5 does not make sense but could be corrected by recomputation.

From: Markus Ritsch [mailto:mlritsch@water-and-earth.com]
Sent: Tuesday, March 11, 2014 1:21 PM
To: David Leader
Cc: Rob Niedenzu
Subject: RE: A2 Self Report Data Reception at District

Dave,

Yes....I'm seeing similar differences.....I'm concerned that we are seeing such differences with the A2 self-reporting.

Should not we be seeing exactly the same data on both base stations?

From: David Leader [mailto:DLeader@hydrolynx.com]
Sent: Tuesday, March 11, 2014 2:17 PM
To: Markus Ritsch
Cc: Rob Niedenzu
Subject: RE: A2 Self Report Data Reception at District

Markus,
I noticed that NS5 missed reports at
2014-02-02 14:53:11
2014-02-03 02:10:14
and Contrails missed reports at
02/03/2014 13:35:37
02/03/2014 13:43:15
NovaStar5 has a bad increment total for
02/03/2014 11:20:14 0.12

Contrails missed the rain counts at the rollover at
02/03/2014 13:35:37

From: Markus Ritsch [mailto:mlritsch@water-and-earth.com]
Sent: Monday, March 10, 2014 3:16 PM
To: David Leader
Cc: Rob Niedenzu
Subject: RE: A2 Self Report Data Reception at District

Dave,

I did a one-to-one comparison of the A2 self-reports received from Maple Grove Reservoir from the OneRain Contrail base and the NS5 base. The attached spreadsheet shows the comparison.....things generally look similar but they are not exact.....please take a look and let me know what you think. I was expecting a closer match of the A2 self-reports.

D. 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 4).

Table 4. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4470	2710										
2710	4470										
2330	2730										
4870	4550										
920	3010										
3010	4330										

*- 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.

III. 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 5). 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 5. District-Wide Total Tip/Count Statistical Summary

Statistical Parameter	Value	Comments
Mean	11.86	Only the 1-mm rain sensors were included in the analysis
Median	11	Only the 1-mm rain sensors were included in the analysis
Standard deviation	6.94	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	32.67	Only the 1-mm rain sensors were included in the analysis
Minimum total count	1	Numerous stations
Maximum total count	26	4110 - Betasso – Boulder County

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 6).

Table 6. 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	73.03	11.31	48.81	22.32	2.98	4.18	22.66
2013	2.96	14.31	21.86	35.96	45.87	16.39	52.33	50.63	229.74	29.64	5.86	4.00	42.46
2014	6.88	11.86											

*- 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 7).

Table 7. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
W. Cherry Creek - Wx	4790	Many jumps in count including 2047 and 255. Scheduled for field visit by WET
Diamond Hill	1420	Service activity on Feb 18, 2014

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 97 percent. A total of 791 incrementing reports were received and a total of 818 reports were expected. The total loss of incrementing reports for the month was approximately 3 percent. Those sensors with the worst event transmission performance are summarized (Table 8).

Table 8. Monthly Summary of Sensors with the Most Missed Tips

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4520	2730										
4010	4330										
4170	4200										
3030	4240										
1460	4870										
1700	4470										

*-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.

IV. Heavy Radio Traffic Analysis

Periods exceeding 1,000 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 9). The five heaviest hours of radio traffic are analyzed to quantify the number of missing rain reports for that hour.

Table 9. Periods of Heavy Radio Traffic (total load includes legacy and A2 reports)

Day	Hour	Expected	Received	Total Load	Loss
28	15	1	1	960	0.00%
13	13	8	8	936	0.00%
25	11	1	1	926	0.00%
28	17	1	1	924	0.00%
28	13	1	1	918	0.00%

V. 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 10).

Table 10. Summary of Unknown IDs

Description	Conc & A2	Legacy
Total number of unknown IDs (IDs without a device definition)	194	210
Total reports from unknown IDs	4,284	401
Unknown IDs with only a single received report (potential noise)	103	138
Total reports from all IDs – RecData Log entire month	456,728	214,698
Unknown reports as a fraction of total reports	0.94%	0.19%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 11) are the total reports received from unknown sensor IDs for each month of the year.

Table 11. Monthly Summary of Total Reports from Unknown IDs (Conc & A2)

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	453	683	774	2,657	3,854	5,466
2013	4,265	994	1,100	2,589	3,623	6,973	5,230	1,070	4,429	781	13,459	1,213
2014	870	4,284										

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 12).

Table 12. Monthly Percent of Unknown Sensor Reports (Conc & A2)

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%	0.11%	0.18%	0.20%	0.72%	1.15%	1.62%
2013	1.40%	0.31%	0.29%	0.60%	0.37%	0.61%	0.82%	0.21%	0.96%	0.31%	5.37%	0.23%
2014	0.14%	0.94%										

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 13).

Table 13. Reports Received by Unknown IDs

ALERT2		Legacy ALERT		Comment
Unknown ID	Reports	Unknown ID	Reports	
2799	3,511	2799	0	Douglas County ID only received as Conc at Diamond Hill
1470	14	1470	17	
2239	9	2239	9	
4031	8	4031	8	
3053	8	3053	0	Douglas County ID only received as Conc at Diamond Hill
2795	8	2795	0	Douglas County ID only received as Conc at Diamond Hill
1534	8	1534	8	
1423	8	1423	10	

VI. Sensors with Invalid Reports

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

Sensor ID	Description	Invalid Reports	Comments
2793	W. Cherry Creek	722	Having cold weather issues with transmitter....WET to visit.
2790	W. Cherry Creek	31	Having cold weather issues with transmitter....WET to visit.
1383	Ferril Lake	631	All data reports resulting in negative stage values, lower limit violation.
1530	Bear Creek at Lowell	11	Many reports received for the month all flagged as questionable
3013	EPC @ Hwy 105	6	Lower limit violation less than stage = 0.00 feet.....

VII. 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.

No rainfall alarms recorded this month.

General System Analysis

Database Name P:\A207-UDFCD-Data-Analysis\2014\2-2014\Novastar_extract_2014Feb.mdb

First Date in Database	2/1/14 12:00 AM	Total Days	28.0
Last Date in Database	2/28/14 11:59 PM	Total Hours	672.0

Total Records Analyzed 456,728 (Conc + A2 self reports)

Records by Group

Wind Data	192,160	42%
Temperature	69,026	15%
Relative Humidity	61,371	13%
Barometric Pressure	31,577	7%
Battery Voltage	26,646	6%
Water Level	11,286	2%
Dew Point Temperature	9,747	2%
Wind Chill	9,721	2%
Solar Radiation	9,568	2%
Peak Wind	9,154	2%
Precipitation	6,991	2%
Fuel Moisture	5,271	1%
Fuel Temperature	5,250	1%
Unknown IDs	3,884	1%
Soil Moisture	2,552	1%
Repeater Status Report	1,283	0%
Dewpoint Temperature	675	0%
Flasher Status	280	0%
12Hr Status Report	163	0%
Repeater Pass List	68	0%
Handar 585 ALARM Status	36	0%
Solar Power	18	0%
ALERT/A2 Testing	1	0%
Total	456,728	

Records by Major Group

Meteorologic Sensors	171,542	38%
Soil and Fuel Sensors	13,073	3%
Water Level Sensors	11,286	2%
Rain Sensors	6,991	2%
Sensor Status Transmissions	1,568	0%
Total	204,460	

Records by Validation Type

Good	0	457,124	100%
Questionable	1	4	0%
Total		457,128	

Sensors With Most Invalid Data

Description	Sensor	Reports
A2-Magnolia WX-AT	6602	1
A2-Magnolia WX-DewPoint	6609	1
A2-Magnolia WX-WindChill	6610	1
A2-Magnolia WX-WindRun	6611	1

Traffic Loading Summary

	Conc + A2		Legacy
Alert Reports	456,728		214,698
Average Daily Traffic	16,326		7,708
Average Hourly Traffic	680		321
Median Hourly Traffic	695	hour beginning	348
Peak Hourly Traffic	960	Feb 28, 3:00 PM	525
2nd Max	936	Feb 13, 1:00 PM	509
3rd Max	926	Feb 25, 11:00 AM	507
4th Max	924	Feb 28, 5:00 PM	500
5th Max	918	Feb 21, 10:00 AM	490

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
2710	Wx-Highlands Ranch WTP	16	7:05	56	29%
100150	A2-Sellers Gulch at Haystack Precip	18	3:51	56	32%
4470	Little Narrows	28	14:57	56	50%
2730	Wx-Salisbury Park	32	15:12	56	57%
4550	Boulder Jail	38	14:12	56	68%
3010	WX-EPC at Hwy 105	40	15:52	56	71%
4330	Hansen Rain	42	12:58	56	75%
4510	Pinewood Springs	43	14:40	56	77%
4870	SBC @ SB Road	46	14:12	56	82%
4850	Porphory Mtn	47	14:14	56	84%
4360	Justice Center	47	13:30	56	84%
4220	Fling's	47	12:56	56	84%
4790	Wx-Button Rock	48	12:36	56	86%
4080	Twin Sisters	48	13:04	56	86%
4040	Martin Gulch	48	13:17	56	86%
920	Wx-Aurora Town Hall	49	12:15	56	88%
4180	Gold Lake	49	13:19	56	88%
4730	Wx-Sugarloaf	50	13:04	56	89%
1440	Wx-Elbert	50	13:13	56	89%
4770	Wx-Cal-Wood Ranch	50	12:32	56	89%
3030	WX-Bingham Lake Park	50	13:02	56	89%
4880	Whispering Pines	50	12:32	56	89%
4490	Apple Valley	50	13:14	56	89%
4350	Conifer Hill	50	12:31	56	89%
4240	Sunset	50	13:04	56	89%
4230	Golden Age	50	12:43	56	89%
4190	Slaughterhouse	50	12:53	56	89%
4170	Pine Brook	50	13:23	56	89%
4050	Walker Ranch	50	13:00	56	89%
4030	Red Garden	50	12:34	56	89%
4710	Wx-Ward C-1	51	12:19	56	91%
1520	Wx-Marston Lake North	51	12:31	56	91%
4750	Wx-Louisville Lake	51	12:48	56	91%
2210	Wx-Hiwan G.C.	51	12:30	56	91%
4530	Winiger Ridge	51	12:55	56	91%
4840	SBC@S Boulder Ditch	51	12:32	56	91%
4830	SBC @ San Souci	51	12:32	56	91%
4820	Doudy Draw	51	12:30	56	91%
4810	Shanahan Ridge	51	12:50	56	91%
4340	Riverside	51	12:32	56	91%
4320	Lee Hill Rain 2012	51	12:30	56	91%
4310	Johnny Park	51	12:50	56	91%
4270	Cannon Mountain	51	12:44	56	91%
4260	Taylor Mountain	51	12:48	56	91%
4250	Geer Canyon	51	12:29	56	91%
4200	Lazy Acres	51	12:32	56	91%
4150	Gold Hill	51	13:04	56	91%
4140	Logan Mill	51	12:33	56	91%
4090	Magnolia	51	12:30	56	91%
4020	Rio Grande	51	13:00	56	91%
4010	Cresent	51	13:01	56	91%
2990	Wx-Tomah Rd-DougCnty	52	12:30	56	93%
2750	Wx-Castle Rock	52	12:45	56	93%
140	Wx-Blue Mountain	52	12:46	56	93%

4860	Fairview Peak	52	12:49	56	93%
4290	Red Hill	52	12:29	56	93%
4160	Sunshine	52	12:45	56	93%
4110	Betasso	52	12:37	56	93%
4100	Filter Plant	52	12:35	56	93%
4060	Lakeshore	52	12:45	56	93%
3020	Wx-West Creek WX	53	12:00	56	95%
1460	Wx-Urban Farm	53	12:03	56	95%
2930	Wx-Spring Valley Rd-DougCnty	53	12:14	56	95%
1420	Wx-Diamond Hill	53	12:32	56	95%
4570	St. Antons	53	12:30	56	95%
4520	Eagle Ridge	53	12:15	56	95%
4300	Big Elk Park	53	12:41	56	95%
4130	Swiss Peaks	53	12:31	56	95%
4070	Bear Peak	53	12:44	56	95%
1000	A2-Maple Grove Resv.	53	12:16	56	95%
900	Wx-Aurora Reservoir	54	12:21	56	96%
1570	Wx-Brighton Ditch	55	12:00	56	98%
750	Wx-Quincy Reservoir	56	11:52	56	100%
1920	Wx-Brighton	56	12:00	56	100%
3070	A2-Newlin Gulch	104	6:18	112	93%
2790	Wx-W. Cherry Creek	115		56	

2330	Morrison	37	16:43	56	66%
2320	Choke Cherry Resvr	46	14:24	56	82%
1710	Shop Creek	18	19:30	56	32%
1700	Cherry Cr @ Champa	53	12:15	56	95%
1660	SPR at Henderson	46	14:11	56	82%
1640	SPR at Union Ave.	49	13:04	56	88%
1550	Lakewood CC	30	12:23	56	54%
1400	Upper Sloan Det.	8	11:58	56	14%
1370	West Metro FS13	28	12:53	56	50%
1360	Denver Zoo	21	16:56	56	38%
1350	Chatfield COE	28	13:20	56	50%
1310	LDC at 64th	16	13:40	56	29%
1300	Hidden Lake	18	12:45	56	32%
1060	Heritage Square	16	13:40	56	29%
1050	Jeffco Fairgrounds	28	12:53	56	50%
1040	Lena @ U.S. Hwy 6	17	13:35	56	30%
1030	NREL/S. Table Mtn.	30	12:24	56	54%
1010	Denver West	30	12:23	56	54%
970	Pump Sta 3	52	12:47	56	93%
840	Fire Station 12	30	13:20	56	54%
830	Side Creek Park	32	12:22	56	57%
760	Mission Viejo Park	32	12:21	56	57%
700	Toll Gate @ 6th	51	12:48	56	91%
540	Parker/Mississippi	27	12:57	56	48%
530	Fire Station #19	31	12:51	56	55%
520	Jewell Detention	31	12:49	56	55%
510	Virginia Court	30	12:23	56	54%
440	Fire Station #7	32	12:21	56	57%
300	Van Bibber Park	28	12:53	56	50%
220	Upper Leyden	30	12:24	56	54%
150	Nott Creek	49	13:03	56	88%
110	Ralston Reservoir	45	13:26	56	80%

Rain Event Performance			Analyze Rain Sensors																	
		Reports Received	791																	
	Systemwide Avg	Total Tips	818																	
	96.70%	Data Loss	3.30%																	
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket						
Wx-Salisbury Park	2730	67%	2	2	0	0	0	0	0	4	6	2	0	0.03937						
Hansen Rain	4330	80%	9	3	0	0	0	0	0	12	15	3	0	0.03937	Mean				11.855	
Lazy Acres	4200	85%	16	0	0	1	0	0	0	17	20	3	0	0.03937	Median				11	
Sunset	4240	86%	5	1	0	0	0	0	0	6	7	1	0	0.03937	St. Dev				6.9394	
SBC @ SB Road	4870	88%	12	2	0	0	0	0	0	14	16	2	0	0.03937	Mean plus 3 SD				32.673	
Little Narrows	4470	89%	14	2	0	0	0	0	0	16	18	2	0	0.03937	Min				1	
A2-Maple Grove Resv.	1000	90%	16	2	0	0	0	0	0	18	20	2	1	0.03937	Max				26	
SBC@S Boulder Ditch	4840	90%	18	0	1	0	0	0	0	19	21	2	0	0.03937						
Wx-Diamond Hill	1420	91%	19	0	1	0	0	0	1	20	22	2	1	0.03937						
Pinewood Springs	4510	92%	21	0	1	0	0	0	0	22	24	2	0	0.03937						
Justice Center	4360	92%	20	2	0	0	0	0	0	22	24	2	0	0.03937						
Wx-West Creek WX	3020	92%	11	1	0	0	0	0	0	12	13	1	0	0.03937						
Doudy Draw	4820	93%	13	1	0	0	0	0	0	14	15	1	0	0.03937						
Whispering Pines	4880	94%	14	1	0	0	0	0	0	15	16	1	0	0.03937						
Betasso	4110	96%	24	1	0	0	0	0	0	25	26	1	0	0.03937						
Wx-Ward C-1	4710	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937						
Wx-Urban Farm	1460	100%	7	0	0	0	0	0	0	7	7	0	1	0.03937						
Wx-Tomah Rd-DougCnty	2990	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937						
Wx-Sugarloaf	4730	100%	8	0	0	0	0	0	0	8	8	0	0	0.03937						
Wx-Spring Valley Rd-DougCnty	2930	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937						
Wx-Quincy Reservoir	750	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937						
Wx-Marston Lake North	1520	100%	8	0	0	0	0	0	0	8	8	0	0	0.03937						
Wx-Louisville Lake	4750	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937						
Wx-Hiwan G.C.	2210	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937						
Wx-Highlands Ranch WTP	2710	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937						
Wx-Elbert	1440	100%	1	0	0	0	0	0	0	1	1	0	0	0.03937						
Wx-Castle Rock	2750	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937						
Wx-Cal-Wood Ranch	4770	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937						
Wx-Button Rock	4790	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937						
Wx-Brighton Ditch	1570	100%	1	0	0	0	0	0	0	1	1	0	0	0.03937						
Wx-Brighton	1920	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937						
Wx-Blue Mountain	140	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937						
WX-Bingham Lake Park	3030	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937						
Wx-Aurora Town Hall	920	100%	1	0	0	0	0	0	0	1	1	0	0	0.03937						
Wx-Aurora Reservoir	900	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937						
SBC @ San Souci	4830	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937						
Shanahan Ridge	4810	100%	24	0	0	0	0	0	0	24	24	0	0	0.03937						
St. Antons	4570	100%	15	0	0	0	0	0	0	15	15	0	0	0.03937						
Boulder Jail	4550	100%	13	0	0	0	0	0	0	13	13	0	0	0.03937						
Eagle Ridge	4520	100%	10	0	0	0	0	0	0	10	10	0	0	0.03937						
Apple Valley	4490	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937						
Conifer Hill	4350	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937						
Riverside	4340	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937						
Lee Hill Rain 2012	4320	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937						
Johnny Park	4310	100%	22	0	0	0	0	0	0	22	22	0	0	0.03937						
Big Elk Park	4300	100%	5	0	0	0	0	0	0	5	5	0	0	0.03937						
Red Hill	4290	100%	24	0	0	0	0	0	0	24	24	0	0	0.03937						
Cannon Mountain	4270	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937						
Taylor Mountain	4260	100%	13	0	0	0	0	0	0	13	13	0	0	0.03937						
Geer Canyon	4250	100%	20	0	0	0	0	0	0	20	20	0	0	0.03937						
Golden Age	4230	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937						
Fling's	4220	100%	12	0	0	0	0	0	0	12	12	0	0	0.03937						

Slaughterhouse	4190	100%	22	0	0	0	0	0	0	22	22	0	0	0.03937
Gold Lake	4180	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937
Pine Brook	4170	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937
Sunshine	4160	100%	14	0	0	0	0	0	0	14	14	0	0	0.03937
Gold Hill	4150	100%	12	0	0	0	0	0	0	12	12	0	0	0.03937
Logan Mill	4140	100%	17	0	0	0	0	0	0	17	17	0	0	0.03937
Swiss Peaks	4130	100%	8	0	0	0	0	0	0	8	8	0	0	0.03937
Filter Plant	4100	100%	15	0	0	0	0	0	0	15	15	0	0	0.03937
Magnolia	4090	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937
Twin Sisters	4080	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Bear Peak	4070	100%	13	0	0	0	0	0	0	13	13	0	0	0.03937
Lakeshore	4060	100%	13	0	0	0	0	0	0	13	13	0	0	0.03937
Walker Ranch	4050	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
Martin Gulch	4040	100%	25	0	0	0	0	0	0	25	25	0	0	0.03937
Red Garden	4030	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937
Rio Grande	4020	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937
Crescent	4010	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937
		Total Tips	769	18	3	1	0	0	1	791	818	27	3	
Morrison	2330	75%	6	3	0	0	0	0	0	9	12	3	0	0.03937
Choke Cherry Resvr	2320	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937
Shop Creek	1710	50%	4	0	0	0	0	1	0	5	10	5	2	0.03937
Cherry Cr @ Champa	1700	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
SPR at Henderson	1660	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
SPR at Union Ave.	1640	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937
Lakewood CC	1550	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Upper Sloan Det.	1400	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
West Metro FS13	1370	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Denver Zoo	1360	100%	5	0	0	0	0	0	0	5	5	0	0	0.03937
Chatfield COE	1350	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
LDC at 64th	1310	63%	4	0	0	1	0	0	0	5	8	3	0	0.03937
Hidden Lake	1300	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Heritage Square	1060	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Jeffco Fairgrounds	1050	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
Lena @ U.S. Hwy 6	1040	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937
NREL/S. Table Mtn.	1030	86%	5	1	0	0	0	0	0	6	7	1	0	0.03937
Denver West	1010	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
Fire Station 12	840	100%	4	0	0	0	0	0	0	4	4	0	1	0.03937
Side Creek Park	830	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Mission Viejo Park	760	100%	3	0	0	0	0	0	0	3	3	0	0	0.03937
Toll Gate @ 6th	700	100%	9	0	0	0	0	0	0	9	9	0	1	0.03937
Parker/Mississippi	540	100%	5	0	0	0	0	0	0	5	5	0	0	0.03937
Fire Station #19	530	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Jewell Detention	520	100%	4	0	0	0	0	0	0	4	4	0	0	0.03937
Virginia Court	510	75%	2	1	0	0	0	0	0	3	4	1	0	0.03937
Fire Station #7	440	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Van Bibber Park	300	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Nott Creek	150	100%	10	0	0	0	0	0	0	10	10	0	0	0.03937
Ralston Reservoir	110	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937
A2-Newlin Gulch	3070	83%	14	0	0	1	0	0	0	15	18	8	0	0.019685
Wx-W. Cherry Creek	2790	100%	4	0	0	0	0	0	17	4	4	0	0	0.03937
WX-EPC at Hwy 105	3010	69%	7	1	0	1	0	0	0	9	13	4	0	0.01
Porphory Mtn	4850	100%	11	0	0	0	0	0	0	11	11	0	0	0.01
Fairview Peak	4860	100%	12	0	0	0	0	0	0	12	12	0	1	0.01
A2-Sellers Gulch at Haystack Precip	100150	100%	2	0	0	0	0	0	0	2	2	0	1	0.03937

2014 Monthly Peak Hour ALERT Radio Traffic Summary

