

# Memo

**Date:** April 5, 2013  
**To:** Kevin Stewart  
**From:** Markus Ritsch  
**Subject:** March 2013 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 March 1 through March 31, 2013.

## II. General System Analysis Summary

In 2013 the District will upgrade the telemetry backbone from legacy ALERT (A1) to the new A2 protocol. As the season progresses, the A1 feed from outlying repeaters to the District base station at Diamond Hill will terminate and all data will be received as A2. The following table quantifies the data reception throughout the conversion of the telemetry system as the season progresses. As of January 29, 2013, 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.

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

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Legacy	321,136	218,368	264,984									
Concentrator	304,067	319,089	379,891									
ALERT2	--	--	16,450									

In 2013, WET will analyze only the concentrator and A2 data each month going forward since only the concentrator and A2 data received at Diamond Hill represents a complete dataset.

### A. Specific Issues Identified this Month

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

**Table 2. Rain Sensors with Poor Performance Characteristics**

Sensor ID	Description	Timer	Event	Comments
2730	Wx-Salisbury Park	35%	100%	Frequency change to 171.100 (West Cr)
2790	Wx- W. Cherry Creek	63%	100%	Frequency change to 171.100 (West Cr)
4550	Boulder Jail	65%	100%	
2710	Wx-Highlands Ranch WTP	68%	100%	Frequency change to 171.100 (West Cr)
4870	SBC @ SB Road	68%	85%	
2733, 2734	Unknown IDs coming from Salisbury Park starting 3/28...need to be re-programmed at next maintenance visit by WET			

Of largest concern this month was a discrepancy between reports logged to the RecDataLog and those logged to the NS5 database. There should be an exact one-to-one relationship between records from RecDataLog to those in the database. On March 4, 2013 this discrepancy was made known to HydroLynx Systems (Dave Leader..the developer of NS5) and to Chris Roark/Don Van Wie the developers of the ALERT2 data backbone and receiver/decoder running at the Diamond Hill base station. At the writing of this report a resolution to this issue has not been identified.

### B. Continuous Operation of Base Receiver/Decoder

Of secondary concern this month was the fact that the data feeds to the NS5 base station were **NOT** in continuous operation for the entire month. Data collection was down on March 10, between 1:59:59 am to 3:00:01 am.

### 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 3).

**Table 3. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)**

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4470	4470	2790									
3070	4550	4550									
1660	4870	2710									
2790	2790	4870									
4870	4490	4270									
2320	4510	4190									

\*- 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 4). 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 4. District-Wide Total Tip/Count Statistical Summary**

Statistical Parameter	Value	Comments
Mean	21.86	Only the 1-mm rain sensors were included in the analysis
Median	22	Only the 1-mm rain sensors were included in the analysis
Standard deviation	10.38	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	53.00	Only the 1-mm rain sensors were included in the analysis
Minimum total count	2	Numerous Stations
Maximum total count	46	Winiger Ridge (4530)

#### B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 5).

**Table 5. 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										

\*- 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 6).

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

Sensor Description	Sensor ID	Comment
Justice Center	4360	March 17 & 18, reccatalog count of 50 stored as 1270 in the database...HydroLynx is investigating

## D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 96 percent. A total of 1,385 incrementing reports were received and a total of 1,443 reports were expected. The total loss of incrementing reports for the month was approximately 4 percent. Those sensors with the worst event transmission performance are summarized (Table 7).

**Table 7. Monthly Summary of Sensors with the Most Missed Tips**

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4470	4510	4270									
2330	2930	4490									
2980	4470	4790									
1660	2980	4510									
--	2730	4320									
--	4790	4870									

\*-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 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 8). Each hour exceeding 1,000 reports was analyzed to quantify the number of missing rain reports for that hour.

**Table 8. Periods of Heavy Radio Traffic**

Day	Hour	Expected	Received	Total Load	Loss
24	13	8	8	727	0%
24	11	38	38	708	0%
10	12	69	69	707	0%
10	13	100	100	706	0%
12	14	82	78	679	4.8%

## 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 9).

**Table 9. Summary of Unknown IDs**

Description	Quantity
Total number of unknown IDs (IDs without a device definition)	372
Total reports from unknown IDs	1,100
Unknown IDs with only a single received report (potential noise)	209
Total reports from all IDs – RecData Log entire month	379,886
Unknown reports as a fraction of total reports	0.29%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 10) are the total reports received from unknown sensor IDs for each month of the year.

**Table 10. 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	453	683	774	2,657	3,854	5,466
2013	4,265	994	1,100									

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 11).

**Table 11. 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%	0.11%	0.18%	0.20%	0.72%	1.15%	1.62%
2013	1.40%	0.31%	0.29%									

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 12).

**Table 12. Reports Received by Unknown IDs**

Unknown ID	Reports	Comment
2733	106	Salisbury Park, started 3/28 10:40 AM
2818	81	Pine Cliff Road, started 3/21 8:44 AM
0	35	
2734	29	Salisbury Park, started 3/28 10:40 AM
109	17	
2768	17	
1470	15	
1950	14	
1954	14	
1423	13	
2239	12	
2745	12	
1951	11	
2811	11	
2215	10	
2784	10	



# General System Analysis

Database Name

P:\A207-UDFCD-Data-Analysis\2013\03-2013\Novastar\_extract\_2013Mar.mdb

First Date in Database

3/1/13 12:00 AM

Total Days

31.0

Last Date in Database

3/31/13 11:59 PM

Total Hours

744.0

Total Records Analyzed

379,891

## Records by Group

Wind Data	136,604	36%
Temperature	68,797	18%
Relative Humidity	61,475	16%
Barometric Pressure	33,760	9%
Water Level	19,946	5%
Battery Voltage	17,038	4%
Precipitation	11,735	3%
Solar Radiation	11,007	3%
Fuel Moisture	5,998	2%
Fuel Temperature	5,967	2%
Soil Moisture	2,970	1%
Repeater Status Report	2,578	1%
Unknown	1,100	0%
12Hr Status Report	445	0%
Repeater Pass List	380	0%
Handar 585 ALARM Status	65	0%
Solar Power	18	0%
Bad Decodes (Concentrator)	6	0%
Dewpoint Temperature	2	0%
<b>Total</b>	<b>379,891</b>	

## Records by Major Group

Meteorologic Sensors	175,039	46%
Water Level Sensors	19,946	5%
Soil and Fuel Sensors	14,935	4%
Rain Sensors	11,735	3%
Sensor Status Transmissions	3,486	1%
<b>Total</b>	<b>225,141</b>	

## Traffic Loading Summary

Alert Reports	379,886	
Average Daily Traffic	12,254	
Average Hourly Traffic	511	
Median Hourly Traffic	505	hour beginning
Peak Hourly Traffic	727	Mar 24, 1:00 PM
2nd Max	708	Mar 10, 12:00 PM
3rd Max	708	Mar 24, 11:00 AM
4th Max	706	Mar 10, 1:00 PM
5th Max	679	Mar 12, 2:00 PM

# Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
2730	Wx-Salisbury Park	22	11:58	62	35%
2790	Wx-W. Cherry Creek	39	17:51	62	63%
4550	Boulder Jail	40	17:26	62	65%
2710	Wx-Highlands Ranch WTP	42	11:22	62	68%
4870	SBC @ SB Road	42	16:06	62	68%
4270	Cannon Mountain	46	14:03	62	74%
4190	Slaughterhouse	47	13:09	62	76%
3020	Wx-West Creek WX	48	12:01	62	77%
4490	Apple Valley	48	13:39	62	77%
4470	Little Narrows	50	12:32	62	81%
920	Wx-Aurora Town Hall	52	13:58	62	84%
4850	Porphory Mtn	53	13:52	62	85%
4510	Pinewood Springs	53	13:57	62	85%
4330	Hansen Rain	53	13:01	62	85%
2930	Wx-Spring Valley Rd-DougCnty	55	13:22	62	89%
4350	Conifer Hill	55	12:14	62	89%
4290	Red Hill	55	13:00	62	89%
4180	Gold Lake	55	13:20	62	89%
2990	Wx-Tomah Rd-DougCnty	56	13:26	62	90%
4250	Geer Canyon	56	13:14	62	90%
4220	Fling's	56	12:46	62	90%
4100	Filter Plant	56	13:10	62	90%
1420	Wx-Diamond Hill	57	12:01	62	92%
3030	WX-Bingham Lake Park	57	12:55	62	92%
4080	Twin Sisters	57	12:28	62	92%
1460	Wx-Urban Farm	58	12:30	62	94%
4880	Whispering Pines	58	12:12	62	94%
4520	Eagle Ridge	58	12:28	62	94%
4360	Justice Center	58	12:13	62	94%
4340	Riverside	58	12:13	62	94%
4240	Sunset	58	12:26	62	94%
4200	Lazy Acres	58	12:45	62	94%
4070	Bear Peak	58	12:27	62	94%
4040	Martin Gulch	58	12:28	62	94%
4030	Red Garden	58	12:13	62	94%
1570	Wx-Brighton Ditch	59	12:26	62	95%
1920	Wx-Brighton	59	12:01	62	95%
4530	Winiger Ridge	59	12:29	62	95%
4860	Fairview Peak	59	12:28	62	95%
4820	Doudy Draw	59	12:12	62	95%
4230	Golden Age	59	12:37	62	95%
4110	Betasso	59	12:29	62	95%
4060	Lakeshore	59	12:22	62	95%
4050	Walker Ranch	59	12:12	62	95%
4020	Rio Grande	59	12:26	62	95%
750	Wx-Quincy Reservoir	60	12:12	62	97%
4750	Wx-Louisville Lake	60	12:00	62	97%
2210	Wx-Hiwan G.C.	60	12:15	62	97%
1440	Wx-Elbert	60	12:13	62	97%
4770	Wx-Cal-Wood Ranch	60	12:01	62	97%
140	Wx-Blue Mountain	60	12:14	62	97%
4830	SBC @ San Souci	60	12:11	62	97%
4810	Shanahan Ridge	60	11:59	62	97%
4570	St. Antons	60	12:16	62	97%

4160	Sunshine	60	12:12	62	97%
4130	Swiss Peaks	60	12:00	62	97%
4090	Magnolia	60	12:12	62	97%
4010	Crescent	60	12:11	62	97%
4730	Wx-Sugarloaf	61	12:01	62	98%
4840	SBC@S Boulder Ditch	61	12:12	62	98%
4320	Lee Hill Rain 2012	61	12:09	62	98%
4310	Johnny Park	61	11:45	62	98%
4300	Big Elk Park	61	11:57	62	98%
4260	Taylor Mountain	61	12:12	62	98%
4170	Pine Brook	61	12:00	62	98%
4150	Gold Hill	61	11:59	62	98%
4140	Logan Mill	61	11:59	62	98%
4710	Wx-Ward C-1	62	11:45	62	100%
900	Wx-Aurora Reservoir	65	11:05	62	105%
1520	Wx-Marston Lake North	66	11:01	62	106%
2750	Wx-Castle Rock	66	11:08	62	106%
4790	Wx-Button Rock	66	11:00	62	106%
3090	Highland Heritage Park-A2	33	12:00	62	53%
3080	Tallman Gulch	23	12:00	62	37%
3060	Fire Sta 47	34	12:23	62	55%
3050	East/West Trailhead	46	12:01	62	74%
3040	CC @ Prairie Canyon Ranch	22	12:00	62	35%
3010	EPC at Hwy 105	52	12:17	62	84%
2980	Dakan Rd	57	12:14	62	92%
2960	Indian Creek	40	14:09	62	65%
2950	DC Public Works	26	11:39	62	42%
2940	Willow Creek - DougCnty	27	11:02	62	44%
2920	West Cherry Head-Douglas Cnty	25	11:28	62	40%
2910	East Cherry Cr-Douglas	23	11:59	62	37%
2900	Russelville Gulch-Douglas	24	12:34	62	39%
2890	Spruce Mt - Douglas	25	11:29	62	40%
2880	Happy Canyon at N Surrey Dr	20	12:42	62	32%
2870	Cottonwood (Apache)	21	13:53	62	34%
2860	CC at Stroh Rd	23	10:49	62	37%
2850	Cherry Cr bl Bayou Glch	20	12:40	62	32%
2840	Sulphur Gulch	23	11:59	62	37%
2810	Pine Cliff Road	20	12:00	62	32%
2800	Columbine Open Space	23	12:00	62	37%
2370	Red Rocks Park	8	13:40	62	13%
2360	Indian Hills	7	13:57	62	11%
2350	Idledale	58	12:40	62	94%
2340	El Rancho	53	12:59	62	85%
2330	Morrison	52	13:39	62	84%
2320	Choke Cherry Resvr	58	12:26	62	94%
2310	Genesee Village	55	12:45	62	89%
2280	Kinney Peak	56	13:09	62	90%
2260	Brook Forest	60	11:58	62	97%
2240	Cold Sprg Glch conf	7	13:57	62	11%
2230	Bear Cr below Cub	7	15:57	62	11%
1900	Niver Detention	29	14:16	62	47%
1810	Sand Creek at mouth	60	12:11	62	97%
1800	Sand Creek Park	35	2:11	62	56%
1720	Cherry Cr @ Steele	43	11:59	62	69%
1710	Shop Creek	39	16:43	62	63%
1700	Cherry Cr @ Champa	61	12:01	62	98%
1660	SPR at Henderson	56	12:42	62	90%
1640	SPR at Union Ave.	57	12:41	62	92%



1620	Slaughterhouse Glch	33	11:58	62	53%
1600	Englewood Dam	49	11:59	62	79%
1550	Lakewood CC	58	12:26	62	94%
1530	Bear Creek @ Lowell	32	11:57	62	52%
1500	Powers Park	47	12:33	62	76%
1480	Third Creek at DIA	4	11:57	62	6%
1400	Upper Sloan Det.	27	11:58	62	44%
1370	West Metro FS13	57	12:26	62	92%
1360	Denver Zoo	48	14:24	62	77%
1350	Chatfield COE	49	13:57	62	79%
1340	Sanderson at Xavier	34	12:24	62	55%
1320	SPR at 3rd Ave	32	12:49	62	52%
1310	LDC at 64th	31	13:14	62	50%
1300	Hidden Lake	35	11:58	62	56%
1200	Broomfield 3207	2	11:58	62	3%
1110	Gunbarrel	31	12:22	62	50%
1100	Louisville Rec Ctr	28	12:59	62	45%
1060	Heritage Square	61	11:59	62	98%
1050	Jeffco Fairgrounds	56	12:53	62	90%
1040	Lena @ U.S. Hwy 6	26	11:59	62	42%
1030	NREL/S. Table Mtn.	60	11:57	62	97%
1010	Denver West	58	11:57	62	94%
1000	Maple Grove Resv.	60	11:59	62	97%
970	Pump Sta 3	61	12:01	62	98%
950	Piney at Liverpool	46	12:16	62	74%
940	Sampson Gulch	44	12:54	62	71%
870	Murphy Creek GC	21	12:00	62	34%
860	Sand Cr at Colfax	25	12:31	62	40%
850	Flying J	37	10:35	62	60%
840	Fire Station 12	27	20:34	62	44%
830	Side Creek Park	60	12:11	62	97%
820	ETG @ Buckley	25	13:00	62	40%
810	Granby Ditch @ 6th	38	12:17	62	61%
800	Sable Ditch @ 18th	18	11:57	62	29%
760	Mission Viejo Park	61	11:57	62	98%
730	No Name @ Quincy	43	12:53	62	69%
720	Confluence Pond	45	12:17	62	73%
710	Horseshoe Park Drop	20	11:58	62	32%
700	Toll Gate @ 6th	57	12:44	62	92%
650	Iliff Pond	47	11:58	62	76%
640	Goldsmith @ Eastman	46	12:16	62	74%
630	Temple Pond at DTC	48	11:57	62	77%
620	Quincy/Highline	42	14:19	62	68%
610	Harvard @ Jackson	49	11:40	62	79%
600	Harvard Gulch Park	45	12:16	62	73%
540	Parker/Mississippi	53	13:30	62	85%
530	Fire Station #19	62	11:57	62	100%
520	Jewell Detention	57	12:52	62	92%
510	Virginia Court	60	12:12	62	97%
500	Havana Park	36	12:59	62	58%
440	Fire Station #7	60	12:11	62	97%
430	Utah Park	40	11:58	62	65%
420	Expo Park	36	13:01	62	58%
410	Kelly Dam	26	12:29	62	42%
400	Montview Park	38	12:18	62	61%
330	Van Bibber @ Hwy 93	36	12:44	62	58%
320	Sports Complex	44	10:45	62	71%
310	Guy Hill Ranch	59	12:24	62	95%
300	Van Bibber Park	60	12:11	62	97%

220	Upper Leyden	59	12:26	62	95%
210	Leyden Confluence	37	11:58	62	60%
200	Leyden Reservoir	32	12:23	62	52%
150	Nott Creek	60	12:11	62	97%
120	West Woods	37	12:18	62	60%
110	Ralston Reservoir	38	6:50	62	61%

Rain Event Performance			Reports Received	1,385	Analyze Rain Sensors										
	Systemwide Avg	Total Tips	1,443												
	95.98%	Data Loss	4.02%												
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket	
Cannon Mountain	4270	72%	9	3	1	0	0	0	0	13	18	5	0	0.0393701	
Apple Valley	4490	73%	8	2	1	0	0	0	0	11	15	4	0	0.0393701	
Wx-Button Rock	4790	82%	11	3	0	0	0	0	0	14	17	3	0	0.0393701	
Pinewood Springs	4510	84%	21	5	0	0	0	0	0	26	31	5	0	0.0393701	
Lee Hill Rain 2012	4320	85%	14	3	0	0	0	0	0	17	20	3	0	0.0393701	
SBC @ SB Road	4870	85%	20	2	1	0	0	0	0	23	27	4	0	0.0393701	
Geer Canyon	4250	88%	21	1	1	0	0	0	0	23	26	3	0	0.0393701	
St. Antons	4570	89%	27	4	0	0	0	0	0	31	35	4	0	0.0393701	
Wx-West Creek WX	3020	89%	7	1	0	0	0	0	0	8	9	1	0	0.0393701	
Hansen Rain	4330	89%	23	1	1	0	0	0	0	25	28	3	0	0.0393701	
Golden Age	4230	90%	8	1	0	0	0	0	0	9	10	1	0	0.0393701	
Wx-Tomah Rd-DougCnty	2990	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701	
Eagle Ridge	4520	91%	9	1	0	0	0	0	0	10	11	1	0	0.0393701	
WX-Bingham Lake Park	3030	92%	10	1	0	0	0	0	0	11	12	1	0	0.0393701	
Little Narrows	4470	94%	27	2	0	0	0	0	0	29	31	2	0	0.0393701	
Fling's	4220	94%	28	2	0	0	0	0	0	30	32	2	0	0.0393701	
Wx-Diamond Hill	1420	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701	
Riverside	4340	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701	
Red Garden	4030	95%	20	1	0	0	0	0	0	21	22	1	0	0.0393701	
Whispering Pines	4880	96%	24	1	0	0	0	0	0	25	26	1	0	0.0393701	
Lakeshore	4060	96%	24	1	0	0	0	0	0	25	26	1	0	0.0393701	
SBC @ San Souci	4830	96%	26	1	0	0	0	0	0	27	28	1	0	0.0393701	
Taylor Mountain	4260	97%	27	1	0	0	0	0	0	28	29	1	0	0.0393701	
Rio Grande	4020	97%	27	1	0	0	0	0	0	28	29	1	0	0.0393701	
Slaughterhouse	4190	97%	28	1	0	0	0	0	0	29	30	1	0	0.0393701	
Cresent	4010	97%	28	1	0	0	0	0	0	29	30	1	0	0.0393701	
Gold Hill	4150	97%	29	1	0	0	0	0	0	30	31	1	0	0.0393701	
Johnny Park	4310	97%	32	1	0	0	0	0	0	33	34	1	0	0.0393701	
Betasso	4110	97%	36	1	0	0	0	0	0	37	38	1	0	0.0393701	
Conifer Hill	4350	98%	39	1	0	0	0	0	0	40	41	1	0	0.0393701	
Martin Gulch	4040	98%	40	1	0	0	0	0	0	41	42	1	0	0.0393701	
Wx-Ward C-1	4710	100%	16	0	0	0	0	0	0	16	16	0	0	0.0393701	
Wx-W. Cherry Creek	2790	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
Wx-Urban Farm	1460	100%	14	0	0	0	0	0	0	14	14	0	1	0.0393701	
Wx-Sugarloaf	4730	100%	23	0	0	0	0	0	0	23	23	0	0	0.0393701	
Wx-Quincy Reservoir	750	100%	6	0	0	0	0	0	0	6	6	0	0	0.0393701	
Wx-Marston Lake North	1520	100%	25	0	0	0	0	0	0	25	25	0	0	0.0393701	
Wx-Louisville Lake	4750	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701	
Wx-Hiwan G.C.	2210	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701	
Wx-Highlands Ranch WTP	2710	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
Wx-Cal-Wood Ranch	4770	100%	13	0	0	0	0	0	0	13	13	0	0	0.0393701	
Wx-Brighton Ditch	1570	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
Wx-Brighton	1920	100%	11	0	0	0	0	0	0	11	11	0	0	0.0393701	
Wx-Blue Mountain	140	100%	18	0	0	0	0	0	0	18	18	0	0	0.0393701	
Wx-Aurora Town Hall	920	100%	2	0	0	0	0	0	0	2	2	0	0	0.0393701	
Wx-Aurora Reservoir	900	100%	5	0	0	0	0	0	0	5	5	0	1	0.0393699	
Winiger Ridge	4530	100%	46	0	0	0	0	0	0	46	46	0	0	0.0393701	
SBC@S Boulder Ditch	4840	100%	30	0	0	0	0	0	0	30	30	0	0	0.0393701	
Doudy Draw	4820	100%	25	0	0	0	0	0	0	25	25	0	0	0.0393701	
Shanahan Ridge	4810	100%	31	0	0	0	0	0	0	31	31	0	0	0.0393701	
Boulder Jail	4550	100%	19	0	0	0	0	0	0	19	19	0	0	0.0393701	
Justice Center	4360	100%	29	0	0	0	0	0	1	29	29	0	0	0.0393701	
Big Elk Park	4300	100%	20	0	0	0	0	0	0	20	20	0	0	0.0393701	
Red Hill	4290	100%	30	0	0	0	0	0	0	30	30	0	0	0.0393701	
Sunset	4240	100%	19	0	0	0	0	0	0	19	19	0	0	0.0393701	
Lazy Acres	4200	100%	31	0	0	0	0	0	0	31	31	0	0	0.0393701	
Gold Lake	4180	100%	31	0	0	0	0	0	0	31	31	0	0	0.0393701	
Pine Brook	4170	100%	21	0	0	0	0	0	0	21	21	0	0	0.0393701	
Sunshine	4160	100%	36	0	0	0	0	0	0	36	36	0	0	0.0393701	
Logan Mill	4140	100%	22	0	0	0	0	0	0	22	22	0	0	0.0393701	
Swiss Peaks	4130	100%	26	0	0	0	0	0	0	26	26	0	0	0.0393701	
Filter Plant	4100	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
Magnolia	4090	100%	24	0	0	0	0	0	0	24	24	0	0	0.0393701	
Twin Sisters	4080	100%	17	0	0	0	0	0	0	17	17	0	0	0.0393701	
Bear Peak	4070	100%	20	0	0	0	0	0	0	20	20	0	0	0.0393701	
Walker Ranch	4050	100%	10	0	0	0	0	0	0	10	10	0	0	0.0393701	
Total			1332	48	5	0	0	0	1	1385	1443	58	2		
Fairview Peak	4860	98%	49	1	0	0	0	0	0	50	51	1	1	0.01	
Porphyry Mtn	4850	94%	14	1	0	0	0	0	0	15	16	1	0	0.01	
Highland Heritage Park-A2	3090	100%	5	0	0	0	0	0	0	5	5	0	0	0.0393701	
Tallman Gulch	3080	100%	7	0	0	0	0	0	0	7	7	0	0	0.0393701	
Fire Sta 47	3060	86%	5	1	0	0	0	0	0	6	7	1	0	0.0393701	
East/West Trailhead	3050	58%	6	0	0	0	0	1	1	7	12	5	0	0.0393701	
CC @ Prairie Canyon Ranch	3040	60%	2	0	1	0	0	0	0	3	5	2	0	0.0393701	
EPC at Hwy 105	3010	80%	15	0	0	0	1	0	0	16	20	4	0	0.01	

Dakan Rd	2980	71%	6	4	0	0	0	0	0	1	10	14	4	0	0.0393701
Indian Creek	2960	93%	13	1	0	0	0	0	0	0	14	15	1	0	0.0393701
DC Public Works	2950	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Willow Creek - DougCnty	2940	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
West Cherry Head-Douglas Cnty	2920	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
East Cherry Cr-Douglas	2910	100%	2	0	0	0	0	0	0	0	2	2	0	0	0.0393701
Russelville Gulch-Douglas	2900	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Happy Canyon at N Surrey Dr	2880	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Cottonwood (Apache)	2870	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
CC at Stroh Rd	2860	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Cherry Cr bl Bayou Glch	2850	78%	6	0	1	0	0	0	0	0	7	9	2	0	0.0393701
Sulphur Gulch	2840	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Pine Cliff Road	2810	100%	7	0	0	0	0	0	0	1	7	7	0	0	0.0393701
Columbine Open Space	2800	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Red Rocks Park	2370	80%	3	1	0	0	0	0	0	0	4	5	1	0	0.0393701
Indian Hills	2360	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
Idledale	2350	90%	17	2	0	0	0	0	0	0	19	21	2	0	0.0393701
El Rancho	2340	88%	6	1	0	0	0	0	0	0	7	8	1	0	0.0393701
Morrison	2330	94%	29	2	0	0	0	0	0	0	31	33	2	0	0.0393701
Genesee Village	2310	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.0393701
Kinney Peak	2280	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Brook Forest	2260	90%	17	0	1	0	0	0	0	0	18	20	2	0	0.0393701
Cold Sprg Glch conf	2240	60%	1	2	0	0	0	0	0	0	3	5	2	0	0.0393701
Bear Cr below Cub	2230	75%	2	1	0	0	0	0	0	0	3	4	1	0	0.0393701
Niver Detention	1900	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Sand Creek at mouth	1810	100%	17	0	0	0	0	0	0	0	17	17	0	0	0.0393701
Sand Creek Park	1800	50%	0	1	0	0	0	0	0	0	1	2	1	0	0.0393701
Cherry Cr @ Steele	1720	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.0393701
Shop Creek	1710	83%	14	0	0	1	0	0	0	0	15	18	3	0	0.0393701
Cherry Cr @ Champa	1700	100%	15	0	0	0	0	0	0	0	15	15	0	0	0.0393701
SPR at Henderson	1660	71%	3	2	0	0	0	0	0	0	5	7	2	0	0.0393701
SPR at Union Ave.	1640	92%	11	1	0	0	0	0	0	0	12	13	1	0	0.0393701
Slaughterhouse Glch	1620	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Englewood Dam	1600	90%	8	1	0	0	0	0	0	0	9	10	1	1	0.0393701
Lakewood CC	1550	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.0393701
Bear Creek @ Lowell	1530	100%	7	0	0	0	0	0	0	1	7	7	0	0	0.0393701
Powers Park	1500	85%	20	2	1	0	0	0	0	0	23	27	4	0	0.0393701
Third Creek at DIA	1480	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701
Upper Sloan Det.	1400	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
West Metro FS13	1370	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Denver Zoo	1360	88%	24	4	0	0	0	0	0	0	28	32	4	0	0.0393701
Chatfield COE	1350	71%	7	2	1	0	0	0	0	0	10	14	4	0	0.0393701
Sanderson at Xavier	1340	87%	12	0	1	0	0	0	0	1	13	15	2	0	0.0393701
SPR at 3rd Ave	1320	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
LDC at 64th	1310	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Hidden Lake	1300	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Broomfield 3207	1200	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Gunbarrel	1110	100%	4	0	0	0	0	0	0	0	4	4	0	0	0.0393701
Louisville Rec Ctr	1100	67%	1	1	0	0	0	0	0	1	2	3	1	1	0.0393701
Heritage Square	1060	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Jeffco Fairgrounds	1050	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.0393701
Lena @ U.S. Hwy 6	1040	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.0393701
NREL/S. Table Mtn.	1030	100%	7	0	0	0	0	0	0	0	7	7	0	0	0.0393701
Denver West	1010	95%	20	1	0	0	0	0	0	0	21	22	1	0	0.0393701
Maple Grove Resv.	1000	100%	30	0	0	0	0	0	0	0	30	30	0	0	0.0393701
Pump Sta 3	970	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Piney at Liverpool	950	100%	13	0	0	0	0	0	0	0	13	13	0	0	0.0393701
Sampson Gulch	940	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393699
Murphy Creek GC	870	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Sand Cr at Colfax	860	100%	7	0	0	0	0	0	0	0	7	7	0	2	0.0393701
Flying J	850	86%	10	2	0	0	0	0	0	0	12	14	2	0	0.0393701
Fire Station 12	840	60%	4	1	0	1	0	0	0	2	6	10	4	0	0.0393701
Side Creek Park	830	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
ETG @ Buckley	820	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Granby Ditch @ 6th	810	63%	10	0	1	0	0	0	1	0	12	19	7	0	0.0393701
Sable Ditch @ 18th	800	67%	1	1	0	0	0	0	0	0	2	3	1	0	0.0393701
Mission Viejo Park	760	100%	11	0	0	0	0	0	0	0	11	11	0	0	0.0393701
No Name @ Quincy	730	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.0393701
Confluence Pond	720	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Toll Gate @ 6th	700	92%	11	1	0	0	0	0	0	0	12	13	1	1	0.0393701
Iliff Pond	650	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393701
Goldsmith @ Eastman	640	93%	13	1	0	0	0	0	0	0	14	15	1	0	0.0393701
Temple Pond at DTC	630	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393701
Quincy/Highline	620	73%	9	1	0	1	0	0	0	0	11	15	4	0	0.0393701
Harvard @ Jackson	610	96%	24	1	0	0	0	0	0	0	25	26	1	0	0.0393701
Harvard Gulch Park	600	94%	14	1	0	0	0	0	0	0	15	16	1	0	0.0393701
Parker/Mississippi	540	90%	8	1	0	0	0	0	0	0	9	10	1	0	0.0393701
Fire Station #19	530	100%	19	0	0	0	0	0	0	0	19	19	0	0	0.0393701
Jewell Detention	520	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Virginia Court	510	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Havana Park	500	100%	1	0	0	0	0	0	0	0	1	1	0	0	0.0393701

Fire Station #7	440	93%	13	1	0	0	0	0	0	0	14	15	1	0	0.0393701
Utah Park	430	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Expo Park	420	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701
Kelly Dam	410	75%	2	1	0	0	0	0	0	0	3	4	1	0	0.0393701
Montview Park	400	86%	5	1	0	0	0	0	0	0	6	7	1	0	0.0393701
Van Bibber @ Hwy 93	330	100%	12	0	0	0	0	0	0	0	12	12	0	0	0.0393701
Sports Complex	320	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.0393701
Guy Hill Ranch	310	89%	7	1	0	0	0	0	0	0	8	9	1	0	0.0393701
Van Bibber Park	300	100%	14	0	0	0	0	0	0	0	14	14	0	0	0.0393701
Upper Leyden	220	100%	18	0	0	0	0	0	0	0	18	18	0	0	0.0393701
Leyden Confluence	210	100%	6	0	0	0	0	0	0	1	6	6	0	0	0.0393701
Leyden Reservoir	200	89%	7	1	0	0	0	0	0	0	8	9	1	0	0.0393701
Nott Creek	150	97%	27	1	0	0	0	0	0	0	28	29	1	0	0.0393701
West Woods	120	100%	8	0	0	0	0	0	0	0	8	8	0	0	0.0393701
Ralston Reservoir	110	100%	3	0	0	0	0	0	0	0	3	3	0	0	0.0393701

## 2013 Monthly ALERT Radio Traffic Summary

