

Memo

Date: April 6, 2015
To: Kevin Stewart
From: Markus Ritsch
Subject: March 2015 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 March 1 through March 31, 2015.

II. General System Analysis Summary

In 2015 data will be received at the District through both the legacy ALERT channel and through the ALERT2 (concentrator plus A2 self-reports) channel. The following (Table 1) quantifies the data reports received through each telemetry channel.

Table 1. Reception of Data at Diamond Hill (Legacy, ALERT2 and Concentrator Reports)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Legacy	216,461	241,285	268,551									
Concentrator	366,229	405,210	443,612									
ALERT2	172,927	233,617	286,836									
TOTAL	755,617	880,112	998,999	0	0	0	0	0	0	0	0	0
Conc+A2	539,156	638,827	730,448									
Conc/Leg	1.69	1.68	1.65									
DataChron	529,216	564,798	652,811									

The District operates two redundant NovaStar5 base stations: the primary (ns5a) at Diamond Hill and a redundant base (ns5b) at Greenhouse Data. Additional analyses are conducted on the data received by these two base stations (Table 2). The data received by both base stations for the month are shown below.

Table 2. Comparison of Data Reception by ns5a and ns5b

NS5A (Diamond Hill)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Legacy	216,461	241,285	268,551							
Concentrator	366,229	405,210	443,612							
ALERT2	172,927	233,617	286,836							
NS5B (Greenhouse)										
Legacy	244,232	241,143	268,417							
Concentrator	409,951	405,875	444,660							
ALERT2	191,784	234,150	289,044							
Diff (NS5a-NS5b)										
Legacy (Digi One)	-27,771	142	134							
Concentrator (B2010)	-43,722	-665	-1048							
ALERT2 (B2010)	-18,857	-533	-2208							
Comments	Failed hard drive on ns5a		Tot A2 diff 1%							

The total difference in reports received by Diamond Hill and Greenhouse is relatively small. Of interest is the difference on a sensor-by-sensor basis to see if the total difference focuses on any specific sensors.

The sensors with the largest reception differences for concentrator and ALERT2 reports are summarized (Table 3).

Of interest is the fact that several sensors have a large difference in reports received at Greenhouse versus Diamond Hill. For example the Greenhouse server received 17 percent more reports from the James Creek site than did Diamond Hill.

Table 3. Largest Reception Differences between Greenhouse and Diamond Hill (Conc & A2)

Sensor	Count Difference (GH-DH)	Percent
Ward C-1 (4711)	124	3.02
Diamond Hill Wind Direction (1418)	58	1.00
Brighton Wind Direction (1918)	54	3.9
Diamond Hill (1421)	38	1.3
Urban Farm (1471)	35	1.2
Lena @ U.S. Hwy 6 (1040)	5	16.7
Upper Leyden (216)	6	15.8
SPR at Henderson (1660)	7	13.7
Upper Leyden (220)	6	12.2
A2-James Cr at Jamestown Stage	204	17.6
A2-James Cr at Jamestown Battery	203	17.5
A2-Carr Street Precipitation (100)	108	3.9
A2-Carr Street Stage (103)	108	4.0
A2-Carr Street Battery (105)	107	4.0

Both Greenhouse and Diamond Hill receive the ALERT2 reports from the IP/Serial feed off the B2010 decoder and both use the NS5 base station software to decode data. The primary difference is the network between the B2010 decoder and each base station. A further quantification of the James Creek reports by repeater is warranted (Table 4).

Table 4. Reception of ALERT2 James Creek Stage (100177) Reports by Repeater

Base Station	Smoky (6502)	Lee Hill (6505)	Gold Hill (6506)	Total
Greenhouse	64	719	379	1162
Diamond Hill	64	719	175	958
Difference	0	0	-204	

The entire difference in received reports between Greenhouse and Diamond Hill for the James Creek stage sensor came through the Gold Hill repeater. The distribution of all ALERT2 reports by repeater is shown (Table 5).

Table 5. Reception of All ALERT2 Reports by Greenhouse and Diamond Hill

Base Station	Smoky (6502)	Blue Mt (6503)	Lee Hill (6505)	Gold Hill (6506)	Total
Greenhouse	73,198	70,303	77,927	66,867	288,295
Diamond Hill	73,198	69,606	77,968	65,323	286,095
Difference	0	-697	41	-1,544	-2,200

Greenhouse and Diamond Hill see exactly the same number of reports for ALERT2 sensors reporting through Smoky Hill and nearly the same through Lee Hill. For some reason, Greenhouse sees more reports through Gold Hill and Blue Mt. than does Diamond Hill. At this time, the cause of this difference is NOT known.

The number of total legacy, concentrator and ALERT2 reports received by ns5a and ns5b is fairly consistent. The daily ratio of total concentrator reports received versus total legacy ALERT reports received is shown (Figure 1).

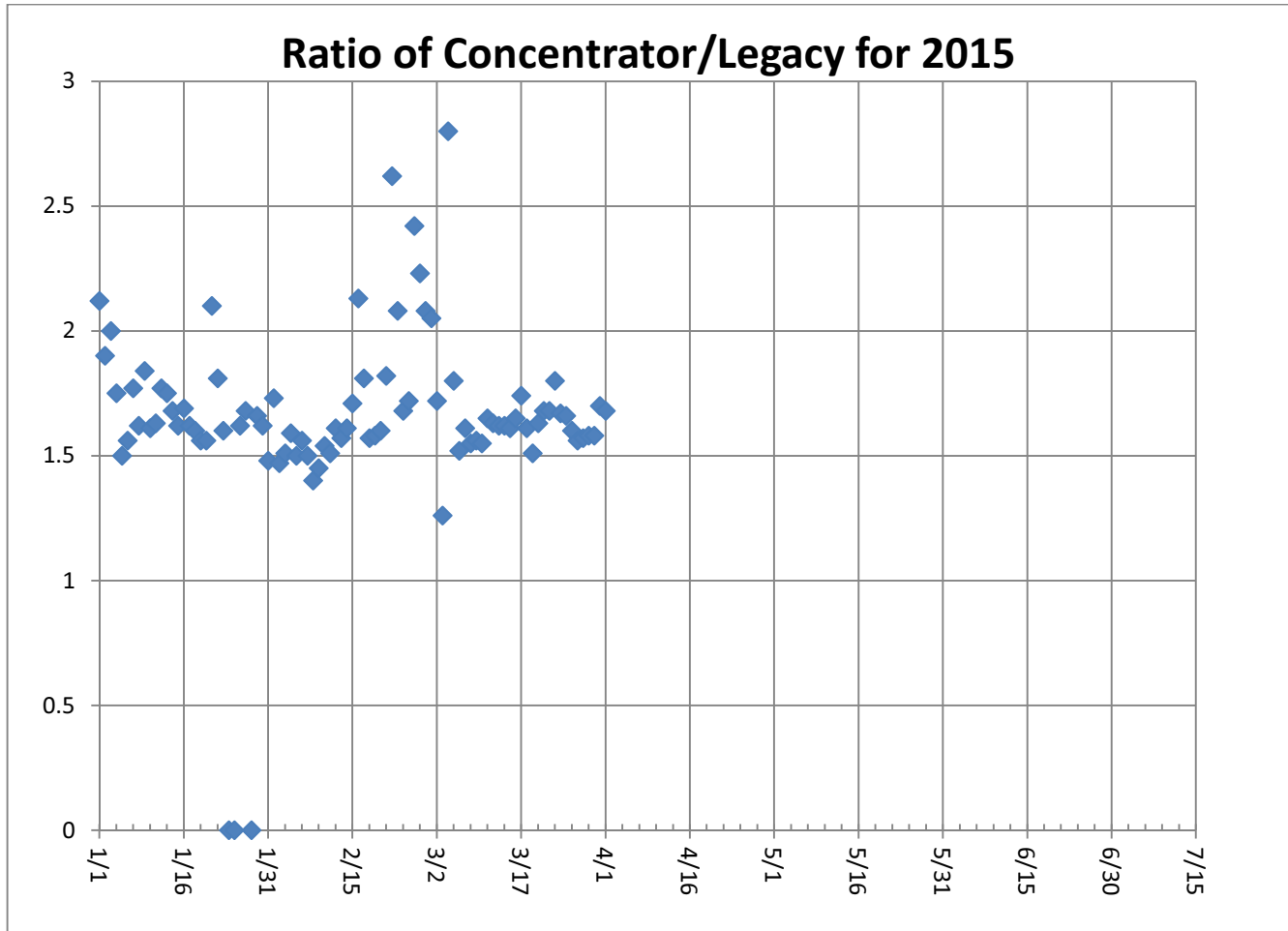


Figure 1. Daily Ratio of Concentrator Reports to Legacy Reports

A low ratio of 1.26 was experienced on March 3rd. The remainder of the month looks very consistent.

At 21:45 on March 2nd, the A2 decoder went down when it would not reboot properly after a newly installed upgrade. At 6:39 AM on March 3rd the decoder successfully recovered without outside intervention. The following email was received from OneRain on March 3rd.

Last evening David Van Wie reset the Diamond Hill decoder after attempting to improve the logging capability of the decoder. This logging information is a valuable tool in diagnosing the latency issues we have been seeing. Unfortunately, the decoder did not recover from the reset. Around 6:40 this morning the decoder recovered. Since that time the unit has been fully operational with no lost data. Our current plan is to leave the equipment in place and continue the path of diagnosing the specific issue, rather than freely replacing equipment.

Communique from OneRain, March 18 - Tomorrow (March 19), weather dependent, we plan on relocating the equipment on the roof of diamond hill down into the server room. During this time there will be outages on both ALERT and ALERT2. I will send an email notifying when the system is down and once again when operational.

Communique from OneRain, March 20 - All equipment was successfully removed from the roof and moved to the server room. The antenna was relocated to the Southeast corner of the building. The ALERT radio was standardized with a Ritron radio and cavity filter. The ALERT2 decoder was replaced with a rack mountable unit.

A. Continuous Operation of Base Receiver/Decoder

The ns5 base stations were NOT in continuous operation for the entire month. The B2010 ALERT2 decoder and ALERT radio were down during the day on March 19 as OneRain moved the equipment from the roof to the server room. The B2010 ALERT2 decoder was down on March 3rd as described above.

B. Specific Issues Identified this Month

Performance of the following sensors (Table 6) was questionable this month.

Table 6. Sensors with Poor Performance Characteristics

Sensor ID	Description	Comments
4470	Little Narrows	Poor event and poor timer performance
100140	A2-Upper Sellers Gulch	Poor event and poor timer performance
100150	A2-Sellers Gulch at Haystack	Poor event and poor timer performance
2812, 2814 2811	Unknown IDs	Pine Cliff Road (2810)

C. Performance of New A2 Sites

This section of the report will look at specific reporting characteristics of the new A2 sites by analyzing their APDUID (Application PDU Identifier). The APDUID is a cyclical, incrementing counter from 0 to 6. Tracking skipped values and restarts of the application control byte counter provides useful insight into site performance and general network health. The performance of the cyclical counter is quantified for each A2 self-reporting site and repeater path (Table 7).

Table 7. APDUID Performance of A2 Sites by Source Address

Description	ID	W. Creek (6001)	Smoky Hill (6502)	Blue Mt. (6503)	Lee Hill (6505)	Gold Hill (6506)
Carr Street (10012)	100		0.915	0.966	0.940	0.609
ETG @ Hampden**	100110		0.142	0.143	0.141	0.131
Murphy Creek (10019)	870		0.959	0.944	0.961	0.904
Maple Grove (10013)	1000		0.968	0.984	0.992	0.936
Lena @ Nolte Pond (10025)	1020		0.985	0.978	0.978	0.924
Newlin Gulch*	3070	--	0.198	0.017	0.095	0.103
Heritage Regional Park	3090		0.507	0.328	0.761	0.821
Lower Left Hand (10018)	4453		0.989	--	0.984	0.065
Magnolia	6602		0.983	0.964	0.997	0.885
Blackstone**	100100		0.143	0.111	0.114	0.136
Upper Sellers	100140	0.567				
Haystack Road	100150	0.538				
Sand Cr at Colfax	100160		0.966	0.977	0.975	0.938
James Creek	100177		0.087	--	0.982	0.239
S. St. Vrain at Berry Ridge	100210		--	--	0.980	0.359
Arvada/Blunn Reservoir***	100227		0.347	0.304	0.347	0.217
Havana Pond	100237		0.989	0.961	0.992	0.876
Westerly Creek Dam	100247		0.995	0.977	0.993	0.985

*-only partial month of data for these sites

**-the APDUID is disabled for these sites.....these are original HSE A2 transmitters and may not support the APDUID

***-strange APDUID count from this site.....WET to visit in April

D. ALERT2 Repeater Loading

The ALERT2 architecture utilizes 5 repeaters with a single transmit frequency (170.300 MHz) to Diamond Hill. The repeaters utilize a 20 second frame where each repeater is allocated a slot of specific size and an offset within the frame. The slot allocated to each repeater is sized appropriately to accommodate the total number of existing and future remote sites routed through that repeater. Each repeater is shown along with its designated slot (Table 8). Currently there is no pass-listing for the ALERT2 repeaters. Any remote ALERT2 site can be received by all repeaters and re-broadcast to the base except for West Creek which has an input frequency unique to Douglas County.

Table 8. ALERT2 Repeater Architecture

Repeater	Slot Size (sec)	Slot Offset (sec)	Source Address	ALERT2 Input Frequency (MHz)	ALERT2 Output Frequency (MHz) – received at Diamond Hill
West Creek	2	0	6001	169.425	170.300
Smoky	3	2	6502	169.525	170.300
Blue Mt.	4	5	6503	169.525	170.300
Lee Hill	3	9	6505	169.525	170.300
Gold Hill	3	12	6506	169.525	170.300
Magnolia	5	15	6507		170.300
Frame Size	20				

The following tables summarize the total number of reports received through each repeater (Table 9) and the distribution of reports by time slot (Table 10). This quantifies repeater loading for the ALERT2 backbone.

Table 9. ALERT2 Reports Received through Each Repeater

Month	West Creek (6001)	Smoky (6502)	Blue Mt. (6503)	Lee Hill (6505)	Gold Hill (6506)	Magnolia (6507)	TOTAL
Jan	0	44,501	44,636	44,783	39,007	0	172,927
Feb	0	58,543	56,150	61,160	57,764	0	233,617
Mar	346	73,198	69,604	77,968	65,323	0	286,439

Table 10. Messages Received by Time Slot (Concentrator and A2 Self Reports)

Tot	West Cr. (6001)		Smoky (6502)			Blue Mt. (6503)				Lee Hill (6505)			Gold Hill (6506)			Magnolia (6507)				
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
59509	3545	66672	5785	1100	98188	7268	1045	425	15305	2532	420	19372	958	401	391	427	436	469	442	
55889	962	48767	3017	169	9465	221	70	62	18529	245	69	25729	130	98	104	98	108	145	157	
50910	1415	30128	2350	285	38092	2887	913	1064	67498	4551	840	73101	1773	743	929	875	1043	1171	1156	
730,448	166,308	5,922	145,567	11,152	1,554	145,745	10,376	2,028	1,551	101,332	7,328	1,329	118,202	2,861	1,242	1,424	1,400	1,587	1,785	1,755

The following tables summarize the system-wide latency of ALERT2 self-reports (Table 11 and Table 12). The latency is computed as the difference in seconds between the reception time of an ALERT2 self-report at the base station and the report time stamp issued by the transmitter.

Table 11. System-Wide Latency of ALERT2 Self-Reports (seconds)

Statistical Parameter	Value	Comments
Mean	35.66	The average time it took a report from the field to reach the base
Minimum	3	
Maximum	3,706	Large latency observed on March 8 th due to Daylight Savings Time

Table 12. Summary of ALERT2 System-Wide Latency (seconds)

Statistical Parameter	Feb	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean	340	35.7									
Minimum	5	3									
Maximum	35,209	3,706									

*-Daylight savings time

Latencies on the order of one hour (3,600 sec) were noticed from both concentrator and A2 reports on March 8th between 2:00 AM and 3:00 AM. The large latency was observed across all the repeaters and from legacy reports as well. It looks as if the base station were down for 1 hour from 2:00 AM to 3:00 AM on March 8th. This happens to correspond to the switch to daylight savings time.

E. Rain Sensor Timer Reporting Summary

The following analysis assumes that each legacy rain sensor has a 12-hour timer-reporting interval and each A2 rain sensor has a 1-hour timer-reporting interval. The worst performing rain sensors for the month are summarized (Table 13).

Table 13. Monthly Summary of Sensors with Poor Timer Performance (Sensor ID)

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4470	4470	4470									
700	2330	4270									
2330	4870	2790									
4240	3010	4240									
3010	1660	4870									
4870	4240	3010									

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

Statistical Parameter	Value	Comments
Mean	20.78	Only the 1-mm rain sensors were included in the analysis
Median	20	Only the 1-mm rain sensors were included in the analysis
Standard deviation	7.81	Only the 1-mm rain sensors were included in the analysis
Mean plus three standard deviations	44.22	Only the 1-mm rain sensors were included in the analysis
Minimum total count	2	Brook Forest (2260)
Maximum total count	42	Wx-Tomah Road – Douglas County (2990)
Sensors showing NO rain for the month		Several
Sensors greater than 3 SD (over reporting)	0	None

B. Monthly Average Tip/Count Summary

A monthly summary of the District-wide mean total tip/count is presented (Table 15).

Table 15. 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	25.91	29.30	77.30	29.16	99.73	43.59	50.96	29.26	13.36	8.11	35.54
2015	9.88	24.42	20.78										

*- 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 16).

Table 16. Sensors with a Jump of 6 or More in Sequential Count

Sensor Description	Sensor ID	Comment
Slaughterhouse Gulch	1620	
Wx-EPC at Hwy 105	3010	

D. Sensor-by-Sensor Incrementing Count Summary

The system-wide reception rate of incrementing, 1-mm tip reports for the month was approximately 95 percent. A total of 1,367 incrementing reports were received and a total of 1,434 reports were expected. The total loss of incrementing reports for the month was approximately 5 percent. Those sensors with the worst event transmission performance are summarized (Table 17).

Table 17. Monthly Summary of Sensors with the Worst Performance

Jan*	Feb*	Mar*	Apr	May	Jun	Jul	Aug	Sep	Oct*	Nov*	Dec*
4470	2330	100150									
700	4470	4470									
4750	700	2340									
4330	2320	100140									
2790	4330	1520									
4870	4870	1100									

*-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. 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 18).

Table 18. Summary of Unknown IDs

Description	Concentrator	Legacy
Total number of unknown IDs (IDs without a device definition)	347	372
Total reports from unknown IDs	1,524	995
Unknown IDs with only a single received report (potential noise)	167	213
Total reports from all IDs – RecData Log entire month	443,612	268,596
Unknown reports as a fraction of total reports	0.34%	0.37%

The total number of reports from unknown sensors is very small relative to the total reports received for the month. Shown below (Table 19) are the total reports received from unknown sensor IDs for each month of the year.

Table 19. Monthly Summary of Total Reports from Unknown IDs (Concentrator)

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	2,399	2,104	25,746	1,832	3,983	268	369	448	470	1,099
2015	542	9,137	1,524									

The fraction of reports from unknown sensors relative to the total number of reports is shown below (Table 20).

Table 20. Monthly Percent of Unknown Sensor Reports (Concentrator)

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%	0.40%	0.34%	3.95%	0.34%	0.66%	0.03%	0.03%	0.07%	0.11%	0.26%
2015	0.15%	2.25%	0.34%									

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 21).

Table 21. Reports Received by Unknown IDs

Concentrator		Legacy ALERT		Comment
Unknown ID	Reports	Unknown ID	Reports	
2812	163	2274	58	Unknown IDs coming from Pine Cliff Road (2810)
2814	160	623	53	
2811	158	1339	48	
2274	63	1430	26	
623	51	709	19	
1339	45	2283	17	
1430	22	718	16	

V. Sensors with Invalid Reports

The sensors below (Table 22 and Table 23) have the largest number of invalid decodes as determined by the validation process defined at the District NovaStar5 base station. These invalid reports may indicate poor radio paths (bit flip/contention errors/random decode) or validation criteria that do not match the physical installation at the site.

Table 22. Rain Sensors with the Most Invalid Reports

Sensor ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bear Creek @ Lowell (1530)	5	6	2									
Pine Cliff Road (2810)	4	5	6									
Wx-West Creek (3020)	0	0	10									
Wx-Castle Rock (2750)	0	0	5									
Shop Creek (1710)	0	0	3									

Table 23. Level Sensors with the Most Invalid Reports

Sensor ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ferril Lake (1383)	666	667	725									
A2-Lena @ Nolte Pond (1023)	na	545	745									
A2-Westerly Cr Dam (100247)	0	0	325									
A2-ETG@Hampden (100117)	0	0	286									
Piney at Liverpool (953)	0	0	228									
Flying J (853)	0	0	52									
Sanderson at Xavier (1343)	0	0	31									
Leyden Reservoir (203)	0	0	17									
Little Narrows (4473)	33	208	2									

VI. 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.

ID	Description	Alarm Description	Date/Time	Threshold (in)	Total Rain (in)
	None this month				

General System Analysis

Database Name

P:\A207-UDFCD-Data-Analysis\2015\03-2015\Novastar_extract_2015Mar.mdb

First Date in Database
Last Date in Database

3/1/15 12:00 AM
3/31/15 11:59 PM

Total Days
Total Hours

31.0
744.0

Total Records Analyzed

443,612

Records by Group	Concentrator	Percent	Legacy	Percent
Wind Data	184,649	41.6%	103,156	38.4%
Temperature	71,181	16.0%	38,412	14.3%
Relative Humidity	63,795	14.4%	38,396	14.3%
Barometric Pressure	34,916	7.9%	20,708	7.7%
Battery Voltage	25,185	5.7%	12,040	4.5%
Water Level	17,274	3.9%	16,226	6.0%
Precipitation	11,529	2.6%	9,344	3.5%
Solar Radiation	10,782	2.4%	10,621	4.0%
Fuel Temperature	5,825	1.3%	5,652	2.1%
Fuel Moisture	5,812	1.3%	5,634	2.1%
Wind Direction	4,689	1.1%	0	0.0%
Soil Moisture	2,830	0.6%	2,725	1.0%
Repeater Status Report	2,324	0.5%	2,875	1.1%
Unknown	1,524	0.3%	995	0.4%
ET-Hourly	721	0.2%	730	0.3%
12Hr Status Report	315	0.1%	312	0.1%
Not Used	105	0.0%	104	0.0%
Repeater Pass List	61	0.0%	537	0.2%
Handar 585 ALARM Status	32	0.0%	39	0.0%
ET-Daily	27	0.0%	30	0.0%
GPS Lock	21	0.0%	0	0.0%
Solar Power	14	0.0%	14	0.0%
Longmont Water Level PT	1	0.0%	1	0.0%
Total	443,612	100.0%	268,551	100.0%

Traffic Loading Summary	Concentrator		Legacy	
Alert Reports	443,612		268,551	
Average Daily Traffic	14,310		8,664	
Average Hourly Traffic	596		361	
Median Hourly Traffic	598	hour beginning	367	hour beginning
Peak Hourly Traffic	898	Mar 25, 12:00 PM	598	Mar 19, 1:00 AM
2nd Max	879	Mar 25, 11:00 AM	574	Mar 18, 12:00 PM
3rd Max	878	Mar 25, 1:00 PM	552	Mar 25, 12:00 PM
4th Max	874	Mar 19, 1:00 AM	538	Mar 25, 1:00 PM
5th Max	857	Mar 2, 1:00 PM	536	Mar 19, 12:00 AM

Rain Timer Performance

Analyze Rain Sensors

Rain Sensors	Description	Rcv	Timer	Exp	Performance
100240	A2-Westerly Cr Dam Precip	10	1:00	62	16%
100150	A2-Sellers Gulch at Haystack Precip	10	20:34	62	16%
100140	A2-Upper Sellers Gulch Precip	20	22:30	62	32%
4470	Little Narrows	20	15:42	62	32%
4270	Cannon Mountain	42	17:27	62	68%
2790	Wx-W. Cherry Creek	48	14:52	62	77%
4240	Sunset	50	13:53	62	81%
4870	SBC @ SB Road	51	13:17	62	82%
3010	WX-EPC at Hwy 105	53	12:52	62	85%
4710	Wx-Ward C-1	54	12:19	62	87%
4820	Doudy Draw	54	12:29	62	87%
4510	Pinewood Springs	54	13:03	62	87%
4180	Gold Lake	54	13:04	62	87%
4080	Twin Sisters	54	12:44	62	87%
4060	Lakeshore	54	12:44	62	87%
100110	A2-ETG @ Hampden Precip	55	12:18	62	89%
4830	SBC @ San Souci	55	12:27	62	89%
4490	Apple Valley	55	13:11	62	89%
100100	A2-Blackstone Precip	56	12:15	62	90%
4860	Fairview Peak	56	12:46	62	90%
4570	St. Antons	56	12:51	62	90%
4550	Boulder Jail	56	12:26	62	90%
4220	Fling's	56	11:59	62	90%
4150	Gold Hill	56	11:59	62	90%
4010	Cresent	56	12:43	62	90%
1520	Wx-Marston Lake North	57	12:28	62	92%
1420	Wx-Diamond Hill	57	12:28	62	92%
1920	Wx-Brighton	57	12:28	62	92%
4530	Winiger Ridge	57	12:29	62	92%
4810	Shanahan Ridge	57	11:59	62	92%
4130	Swiss Peaks	57	12:00	62	92%
4110	Betasso	57	12:16	62	92%
4090	Magnolia	57	11:59	62	92%
4030	Red Garden	57	12:28	62	92%
4730	Wx-Sugarloaf	58	12:01	62	94%
4750	Wx-Louisville Lake	58	12:01	62	94%
1440	Wx-Elbert	58	12:27	62	94%
4790	Wx-Button Rock	58	12:28	62	94%
4840	SBC@S Boulder Ditch	58	11:45	62	94%
4330	Hansen Rain	58	12:26	62	94%
4170	Pine Brook	58	12:40	62	94%
4140	Logan Mill	58	11:59	62	94%
4050	Walker Ranch	58	12:40	62	94%
3020	Wx-West Creek WX	59	12:29	62	95%
2990	Wx-Tomah Rd-DougCnty	59	12:01	62	95%
2930	Wx-Spring Valley Rd-DougCnty	59	12:13	62	95%
2730	Wx-Salisbury Park	59	12:02	62	95%
2710	Wx-Highlands Ranch WTP	59	12:22	62	95%
3030	WX-Bingham Lake Park	59	11:57	62	95%
4340	Riverside	59	12:12	62	95%
4250	Geer Canyon	59	12:12	62	95%
4040	Martin Gulch	59	12:13	62	95%
2750	Wx-Castle Rock	60	12:27	62	97%
900	Wx-Aurora Reservoir	60	12:13	62	97%

4520	Eagle Ridge	60	12:01	62	97%
4300	Big Elk Park	60	12:12	62	97%
4290	Red Hill	60	11:59	62	97%
4260	Taylor Mountain	60	12:26	62	97%
4230	Golden Age	60	11:58	62	97%
4200	Lazy Acres	60	12:14	62	97%
4160	Sunshine	60	11:59	62	97%
1460	Wx-Urban Farm	61	12:01	62	98%
750	Wx-Quincy Reservoir	61	11:58	62	98%
2210	Wx-Hiwan G.C.	61	12:01	62	98%
4770	Wx-Cal-Wood Ranch	61	12:01	62	98%
920	Wx-Aurora Town Hall	61	12:01	62	98%
100160	A2-Sand Creek at Colfax Precip	732		744	98%
4880	Whispering Pines	61	11:59	62	98%
4360	Justice Center	61	11:59	62	98%
4320	Lee Hill Rain 2012	61	11:59	62	98%
4310	Johnny Park	61	11:59	62	98%
4100	Filter Plant	61	12:00	62	98%
4070	Bear Peak	61	11:58	62	98%
4020	Rio Grande	61	11:58	62	98%
4350	Conifer Hill	62	11:59	62	100%
4190	Slaughterhouse	62	11:58	62	100%
140	Wx-Blue Mountain	63	11:36	62	102%
1570	Wx-Brighton Ditch	64	11:26	62	103%
6601	A2-Magnolia WX-Precip	91	8:00	62	147%
3090	A2-Highland Heritage Park	35	13:56	62	56%
3080	Tallman Gulch	39	12:21	62	63%
3070	A2-Newlin Gulch Precip	80	6:04	62	129%
3060	Fire Sta 47	40	11:18	62	65%
3050	East/West Trailhead	39	11:49	62	63%
3040	CC @ Russelville Road Precip	41	11:40	62	66%
2980	Dakan Rd	56	12:15	62	90%
2970	Rampart Range Rd-Satellite	172		744	23%
2960	Indian Creek	45	13:08	62	73%
2950	DC Public Works	50	12:26	62	81%
2940	Willow Creek - DougCnty	46	12:35	62	74%
2920	West Cherry Head-Douglas Cnty	52	11:49	62	84%
2910	East Cherry Cr-Douglas	50	12:04	62	81%
2900	Russelville Gulch-Douglas	52	11:34	62	84%
2890	Spruce Mt - Douglas	51	11:48	62	82%
2880	Happy Canyon at N Surrey Dr	36	12:46	62	58%
2870	Cottonwood (Apache)	39	11:59	62	63%
2860	CC at Stroh Rd	39	11:57	62	63%
2850	Cherry Cr bl Bayou Glch	41	12:00	62	66%
2840	Sulphur Gulch	36	12:46	62	58%
2820	Haskins Gulch Conf	49	12:13	62	79%
2810	Pine Cliff Road	37	12:21	62	60%
2370	Red Rocks Park	23	11:58	62	37%
2360	Indian Hills	9	15:23	62	15%
2350	Idledale	13	11:57	62	21%
2340	El Rancho	10	13:17	62	16%
2330	Morrison	33	17:27	62	53%
2320	Choke Cherry Resvr	54	13:21	62	87%
2310	Genesee Village	11	11:58	62	18%
2280	Kinney Peak	8	13:40	62	13%
2270	Cub Cr below Blue	14	8:58	62	23%
2260	Brook Forest	11	12:01	62	18%
2250	Rosedale	10	11:57	62	16%

2240	Cold Sprg Glch conf	16	10:58	62	26%
2230	Bear Cr below Cub	14	11:58	62	23%
1900	Niver Detention	63	8:05	62	102%
1800	Sand Creek Park	56	11:30	62	90%
1720	Cherry Cr @ Steele	43	11:57	62	69%
1710	Shop Creek	43	15:06	62	69%
1700	Cherry Cr @ Champa	58	12:40	62	94%
1660	SPR at Henderson	48	15:04	62	77%
1640	SPR at Union Ave.	62	11:46	62	100%
1620	Slaughterhouse Glch	47	12:16	62	76%
1600	Englewood Dam	51	11:59	62	82%
1550	Lakewood CC	26	11:57	62	42%
1530	Bear Creek @ Lowell	45	11:57	62	73%
1500	Powers Park	47	11:40	62	76%
1480	Third Creek at DIA	17	12:00	62	27%
1400	Upper Sloan Det.	31	10:28	62	50%
1370	West Metro FS13	53	11:59	62	85%
1360	Denver Zoo	36	12:22	62	58%
1350	Chatfield COE	50	12:33	62	81%
1340	Sanderson at Xavier	75	4:03	62	121%
1320	SPR at 3rd Ave	34	12:21	62	55%
1310	LDC at 64th	38	12:19	62	61%
1300	Hidden Lake	40	12:19	62	65%
1200	Broomfield 3207	43	12:19	62	69%
1110	Gunbarrel	29	11:58	62	47%
1100	Louisville Rec Ctr	29	11:59	62	47%
1060	Heritage Square	22	12:37	62	35%
1050	Jeffco Fairgrounds	21	12:40	62	34%
1040	Lena @ U.S. Hwy 6	20	11:59	62	32%
1030	NREL/S. Table Mtn.	25	12:39	62	40%
1010	Denver West	26	11:57	62	42%
1000	A2-Maple Grove Resv.	731		744	98%
970	Pump Sta 3	61	12:01	62	98%
950	Piney at Liverpool	60	11:59	62	97%
940	Aurora Regional Pond	59	12:12	62	95%
870	A2-Murphy Creek GC	730		744	98%
850	Flying J	50	12:46	62	81%
840	Fire Station 12	52	12:01	62	84%
830	Side Creek Park	57	12:26	62	92%
820	ETG @ Buckley	55	11:31	62	89%
810	Granby Ditch @ 6th	41	12:19	62	66%
800	Sable Ditch @ 18th	54	12:13	62	87%
760	Mission Viejo Park	59	11:59	62	95%
730	No Name @ Quincy	67	10:37	62	108%
720	Confluence Pond	60	11:45	62	97%
710	Horseshoe Park Drop	74	9:20	62	119%
700	Toll Gate @ 6th	39	12:20	62	63%
650	Iloff Pond	45	11:59	62	73%
640	Goldsmith @ Eastman	55	11:17	62	89%
630	Temple Pond at DTC	49	12:31	62	79%
620	Quincy/Highline	41	12:18	62	66%
610	Harvard @ Jackson	43	12:33	62	69%
600	Harvard Gulch Park	44	12:14	62	71%
540	Parker/Mississippi	43	12:16	62	69%
530	Fire Station #19	42	11:57	62	68%
520	Jewell Detention	49	12:31	62	79%
510	Virginia Court	56	12:12	62	90%
500	Havana Park	41	12:37	62	66%
440	Fire Station #7	58	11:59	62	94%

430	Utah Park	20	4:12	62	32%
420	Expo Park	46	11:40	62	74%
410	Kelly Dam	44	11:58	62	71%
330	Van Bibber @ Hwy 93	37	12:42	62	60%
320	Sports Complex	37	12:21	62	60%
310	Guy Hill Ranch	27	13:03	62	44%
300	Van Bibber Park	39	11:58	62	63%
220	Upper Leyden	39	12:20	62	63%
210	Leyden Confluence	27	11:58	62	44%
200	Leyden Reservoir	62	11:24	62	100%
150	Nott Creek	27	13:03	62	44%
120	West Woods	40	11:58	62	65%
110	Ralston Reservoir	30	11:31	62	48%
100	A2-Carr Street	732	0:00	744	98%

Rain Event Performance		Reports Received	Reports Received	1,367	Analyze Rain Sensors						0	<<show stations with zero rain (1=yes, 0=no)					
		Systemwide Avg	Total Tips	1,434													
		95.33%	Data Loss	4.67%													
Description	Sensor	Performance	1-tips	2-tips	3-tips	4-tips	5-tips	6-tips	>6-tips	Rcv	Exp	Miss	Hold	Bucket			
Little Narrows	4470	67%	6	3	1	0	0	0	0	10	15	5	0	0.03937			
Wx-Marston Lake North	1520	75%	7	1	1	0	0	0	0	9	12	3	0	0.03937	Mean	20.78261	
Red Garden	4030	82%	7	2	0	0	0	0	0	9	11	2	0	0.03937	Median	20	
Wx-Highlands Ranch WTP	2710	83%	13	1	1	0	0	0	0	15	18	3	0	0.03937	St. Dev	7.811887	
SBC @ SB Road	4870	83%	4	1	0	0	0	0	0	5	6	1	0	0.03937	Mean plus	44.21827	
Wx-Urban Farm	1460	85%	14	3	0	0	0	0	0	17	20	3	0	0.03937	Min	6	
Slaughterhouse	4190	85%	19	4	0	0	0	0	0	23	27	4	0	0.03937	Max	42	
Eagle Ridge	4520	86%	5	1	0	0	0	0	0	6	7	1	0	0.03937			
SBC @ San Souci	4830	88%	12	2	0	0	0	0	0	14	16	2	0	0.03937			
Wx-Castle Rock	2750	88%	22	0	0	1	0	0	0	23	26	3	0	0.03937			
Big Elk Park	4300	89%	15	2	0	0	0	0	0	17	19	2	0	0.03937			
Pinewood Springs	4510	90%	24	3	0	0	0	0	0	27	30	3	0	0.03937			
Hansen Rain	4330	90%	16	2	0	0	0	0	0	18	20	2	0	0.03937			
WX-Bingham Lake Park	3030	91%	28	0	0	1	0	0	0	29	32	3	0	0.03937			
Wx-Brighton	1920	91%	9	1	0	0	0	0	0	10	11	1	0	0.03937			
Boulder Jail	4550	92%	10	1	0	0	0	0	0	11	12	1	0	0.03937			
Cannon Mountain	4270	92%	21	2	0	0	0	0	0	23	25	2	0	0.03937			
Fling's	4220	92%	21	2	0	0	0	0	0	23	25	2	0	0.03937			
Wx-W. Cherry Creek	2790	92%	23	0	1	0	0	0	0	24	26	2	0	0.03937			
Wx-Tomah Rd-DougCnty	2990	93%	37	1	1	0	0	0	0	39	42	3	0	0.03937			
Wx-Aurora Reservoir	900	93%	12	1	0	0	0	0	0	13	14	1	0	0.03937			
SBC@S Boulder Ditch	4840	93%	12	1	0	0	0	0	0	13	14	1	0	0.03937			
Wx-Elbert	1440	93%	13	1	0	0	0	0	0	14	15	1	0	0.03937			
Wx-Button Rock	4790	93%	13	1	0	0	0	0	0	14	15	1	0	0.03937			
St. Antons	4570	94%	28	2	0	0	0	0	0	30	32	2	0	0.03937			
Twin Sisters	4080	94%	14	1	0	0	0	0	0	15	16	1	0	0.03937			
Wx-Cal-Wood Ranch	4770	94%	15	1	0	0	0	0	0	16	17	1	0	0.03937			
Geer Canyon	4250	94%	15	1	0	0	0	0	0	16	17	1	0	0.03937			
Magnolia	4090	95%	17	1	0	0	0	0	0	18	19	1	0	0.03937			
Cresent	4010	95%	19	1	0	0	0	0	0	20	21	1	0	0.03937			
Wx-Spring Valley Rd-DougCnty	2930	96%	21	1	0	0	0	0	0	22	23	1	0	0.03937			
Lazy Acres	4200	96%	21	1	0	0	0	0	0	22	23	1	0	0.03937			
Sunset	4240	96%	23	1	0	0	0	0	0	24	25	1	0	0.03937			
Shanahan Ridge	4810	96%	24	1	0	0	0	0	0	25	26	1	0	0.03937			
Wx-Ward C-1	4710	97%	29	1	0	0	0	0	0	30	31	1	0	0.03937			
Wx-Sugarloaf	4730	97%	29	1	0	0	0	0	0	30	31	1	0	0.03937			
Gold Lake	4180	97%	36	1	0	0	0	0	0	37	38	1	0	0.03937			
Gold Hill	4150	97%	37	1	0	0	0	0	0	38	39	1	0	0.03937			
Wx-West Creek WX	3020	100%	27	0	0	0	0	0	0	27	27	0	0	0.03937			
Wx-Salisbury Park	2730	100%	26	0	0	0	0	0	0	26	26	0	0	0.03937			
Wx-Quincy Reservoir	750	100%	22	0	0	0	0	0	0	22	22	0	0	0.03937			
Wx-Louisville Lake	4750	100%	8	0	0	0	0	0	0	8	8	0	0	0.03937			
Wx-Hiwan G.C.	2210	100%	17	0	0	0	0	0	0	17	17	0	0	0.03937			
Wx-Diamond Hill	1420	100%	22	0	0	0	0	0	0	22	22	0	0	0.03937			
Wx-Blue Mountain	140	100%	14	0	0	0	0	0	0	14	14	0	0	0.03937			
Wx-Aurora Town Hall	920	100%	17	0	0	0	0	0	0	17	17	0	0	0.03937			
Winiger Ridge	4530	100%	31	0	0	0	0	0	0	31	31	0	0	0.03937			
Whispering Pines	4880	100%	24	0	0	0	0	0	0	24	24	0	0	0.03937			
Doudy Draw	4820	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937			
Apple Valley	4490	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937			
Justice Center	4360	100%	24	0	0	0	0	0	0	24	24	0	0	0.03937			
Conifer Hill	4350	100%	32	0	0	0	0	0	0	32	32	0	0	0.03937			
Riverside	4340	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937			
Lee Hill Rain 2012	4320	100%	21	0	0	0	0	0	0	21	21	0	0	0.03937			
Johnny Park	4310	100%	29	0	0	0	0	0	0	29	29	0	0	0.03937			
Red Hill	4290	100%	17	0	0	0	0	0	0	17	17	0	0	0.03937			
Taylor Mountain	4260	100%	18	0	0	0	0	0	0	18	18	0	0	0.03937			
Golden Age	4230	100%	13	0	0	0	0	0	0	13	13	0	0	0.03937			
Pine Brook	4170	100%	14	0	0	0	0	0	0	14	14	0	0	0.03937			
Sunshine	4160	100%	29	0	0	0	0	0	0	29	29	0	0	0.03937			
Logan Mill	4140	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937			
Swiss Peaks	4130	100%	29	0	0	0	0	0	0	29	29	0	0	0.03937			

Betasso	4110	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937
Filter Plant	4100	100%	11	0	0	0	0	0	0	11	11	0	0	0.03937
Bear Peak	4070	100%	15	0	0	0	0	0	0	15	15	0	0	0.03937
Lakeshore	4060	100%	21	0	0	0	0	0	0	21	21	0	0	0.03937
Walker Ranch	4050	100%	12	0	0	0	0	0	0	12	12	0	0	0.03937
Martin Gulch	4040	100%	23	0	0	0	0	0	0	23	23	0	0	0.03937
Rio Grande	4020	100%	23	0	0	0	0	0	0	23	23	0	0	0.03937
		Total Tips	1309	51	5	2	0	0	0	1367	1434	67	0	
A2-Highland Heritage Park	3090	100%	23	0	0	0	0	0	0	23	23	0	0	0.03937
Tallman Gulch	3080	96%	21	1	0	0	0	0	0	22	23	1	0	0.03937
A2-Newlin Gulch Precip	3070	100%	26	0	0	0	0	0	0	26	26	0	0	0.03937
Fire Sta 47	3060	88%	20	1	1	0	0	0	0	22	25	3	0	0.03937
East/West Trailhead	3050	90%	17	0	1	0	0	0	0	18	20	2	0	0.03937
CC @ Russelville Road Precip	3040	96%	22	1	0	0	0	0	0	23	24	1	0	0.03937
Dakan Rd	2980	78%	11	2	1	0	0	0	0	14	18	4	0	0.03937
Rampart Range Rd-Satellite	2970	100%	34	0	0	0	0	0	0	34	34	0	0	0.03937
Indian Creek	2960	96%	21	1	0	0	0	0	0	22	23	1	0	0.03937
DC Public Works	2950	100%	25	0	0	0	0	0	0	25	25	0	0	0.03937
Willow Creek - DougCnty	2940	92%	20	2	0	0	0	0	0	22	24	2	0	0.03937
West Cherry Head-Douglas Cnty	2920	77%	15	1	0	0	1	0	0	17	22	5	0	0.03937
East Cherry Cr-Douglas	2910	75%	14	2	2	0	0	0	0	18	24	6	0	0.03937
Russelville Gulch-Douglas	2900	86%	22	1	0	1	0	0	0	24	28	4	0	0.03937
Spruce Mt - Douglas	2890	95%	17	1	0	0	0	0	0	18	19	1	0	0.03937
Happy Canyon at N Surrey Dr	2880	96%	24	1	0	0	0	0	0	25	26	1	0	0.03937
Cottonwood (Apache)	2870	100%	23	0	0	0	0	0	0	23	23	0	0	0.03937
CC at Stroh Rd	2860	78%	5	2	0	0	0	0	0	7	9	2	0	0.03937
Cherry Cr bl Bayou Glch	2850	100%	28	0	0	0	0	0	0	28	28	0	0	0.03937
Sulphur Gulch	2840	100%	22	0	0	0	0	0	0	22	22	0	0	0.03937
Haskins Gulch Conf	2820	100%	26	0	0	0	0	0	0	26	26	0	0	0.03937
Pine Cliff Road	2810	100%	30	0	0	0	0	0	0	30	30	0	0	0.03937
Red Rocks Park	2370	84%	14	1	1	0	0	0	0	16	19	3	0	0.03937
Indian Hills	2360	67%	7	0	0	0	1	0	0	8	12	4	0	0.03937
Idledale	2350	100%	10	0	0	0	0	0	0	10	10	0	0	0.03937
El Rancho	2340	50%	0	2	0	0	0	0	0	2	4	2	0	0.03937
Morrison	2330	83%	21	3	1	0	0	0	0	25	30	5	0	0.03937
Choke Cherry Resvr	2320	96%	22	1	0	0	0	0	0	23	24	1	0	0.03937
Genesee Village	2310	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Cub Cr below Blue	2270	100%	6	0	0	0	0	0	0	6	6	0	0	0.03937
Brook Forest	2260	100%	2	0	0	0	0	0	0	2	2	0	0	0.03937
Rosedale	2250	67%	1	1	0	0	0	0	0	2	3	1	0	0.03937
Cold Sprg Glch conf	2240	73%	6	1	1	0	0	0	0	8	11	3	0	0.03937
Bear Cr below Cub	2230	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937
Niver Detention	1900	93%	12	1	0	0	0	0	0	13	14	1	0	0.03937
Sand Creek Park	1800	95%	19	1	0	0	0	0	0	20	21	1	0	0.03937
Cherry Cr @ Steele	1720	90%	17	2	0	0	0	0	0	19	21	2	0	0.03937
Shop Creek	1710	75%	2	1	0	0	0	0	0	3	4	1	0	0.03937
Cherry Cr @ Champa	1700	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937
SPR at Henderson	1660	80%	6	2	0	0	0	0	0	8	10	2	0	0.03937
SPR at Union Ave.	1640	100%	15	0	0	0	0	0	0	15	15	0	0	0.03937
Slaughterhouse Glch	1620	44%	3	2	1	0	0	0	1	8	18	4	0	0.03937
Englewood Dam	1600	100%	19	0	0	0	0	0	0	19	19	0	0	0.03937
Lakewood CC	1550	88%	12	2	0	0	0	0	0	14	16	2	0	0.03937
Bear Creek @ Lowell	1530	83%	18	0	0	0	1	0	0	19	23	4	0	0.03937
Powers Park	1500	82%	14	4	0	0	0	0	0	18	22	4	0	0.03937
Upper Sloan Det.	1400	74%	16	1	3	0	0	0	0	20	27	7	3	0.03937
West Metro FS13	1370	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937
Denver Zoo	1360	95%	17	1	0	0	0	0	0	18	19	1	0	0.03937
Chatfield COE	1350	94%	15	1	0	0	0	0	0	16	17	1	0	0.03937
Sanderson at Xavier	1340	100%	18	0	0	0	0	0	0	18	18	0	0	0.03937
SPR at 3rd Ave	1320	91%	19	0	1	0	0	0	0	20	22	2	0	0.03937
LDC at 64th	1310	100%	14	0	0	0	0	0	0	14	14	0	0	0.03937
Hidden Lake	1300	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937
Broomfield 3207	1200	83%	8	2	0	0	0	0	0	10	12	2	0	0.03937
Gunbarrel	1110	100%	7	0	0	0	0	0	0	7	7	0	0	0.03937
Louisville Rec Ctr	1100	64%	6	0	0	0	1	0	0	7	11	4	0	0.03937
Heritage Square	1060	100%	9	0	0	0	0	0	0	9	9	0	0	0.03937

Jeffco Fairgrounds	1050	88%	6	1	0	0	0	0	0	0	7	8	1	0	0.03937
Lena @ U.S. Hwy 6	1040	90%	8	1	0	0	0	0	0	0	9	10	1	0	0.03937
NREL/S. Table Mtn.	1030	100%	11	0	0	0	0	0	0	0	11	11	0	1	0.03937
Denver West	1010	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.03937
A2-Maple Grove Resv.	1000	100%	18	0	0	0	0	0	0	0	18	18	0	0	0.03937
Pump Sta 3	970	100%	9	0	0	0	0	0	0	0	9	9	0	0	0.03937
Piney at Liverpool	950	92%	21	0	1	0	0	0	0	0	22	24	2	0	0.03937
Aurora Regional Pond	940	92%	20	2	0	0	0	0	0	0	22	24	2	0	0.03937
A2-Murphy Creek GC	870	100%	27	0	0	0	0	0	0	0	27	27	0	0	0.03937
Fire Station 12	840	78%	17	0	0	0	0	1	0	0	18	23	5	0	0.03937
Side Creek Park	830	96%	25	1	0	0	0	0	0	0	26	27	1	0	0.03937
ETG @ Buckley	820	91%	18	2	0	0	0	0	0	0	20	22	2	1	0.03937
Granby Ditch @ 6th	810	93%	27	0	1	0	0	0	0	0	28	30	2	0	0.03937
Sable Ditch @ 18th	800	100%	25	0	0	0	0	0	0	0	25	25	0	0	0.03937
Mission Viejo Park	760	92%	21	2	0	0	0	0	0	0	23	25	2	0	0.03937
No Name @ Quincy	730	88%	25	2	1	0	0	0	0	0	28	32	4	0	0.03937
Confluence Pond	720	100%	23	0	0	0	0	0	0	0	23	23	0	0	0.03937
Horseshoe Park Drop	710	92%	21	2	0	0	0	0	0	0	23	25	2	1	0.03937
Toll Gate @ 6th	700	100%	25	0	0	0	0	0	0	0	25	25	0	0	0.03937
Iliff Pond	650	100%	20	0	0	0	0	0	0	0	20	20	0	0	0.03937
Goldsmith @ Eastman	640	88%	13	2	0	0	0	0	0	0	15	17	2	0	0.03937
Temple Pond at DTC	630	88%	19	3	0	0	0	0	0	0	22	25	3	0	0.03937
Quincy/Highline	620	100%	24	0	0	0	0	0	0	0	24	24	0	0	0.03937
Harvard @ Jackson	610	100%	22	0	0	0	0	0	0	0	22	22	0	0	0.03937
Parker/Mississippi	540	88%	19	1	1	0	0	0	0	0	21	24	3	0	0.03937
Fire Station #19	530	89%	22	1	1	0	0	0	0	0	24	27	3	1	0.03937
Jewell Detention	520	89%	22	1	1	0	0	0	0	0	24	27	3	1	0.03937
Virginia Court	510	100%	28	0	0	0	0	0	0	0	28	28	0	0	0.03937
Havana Park	500	96%	22	1	0	0	0	0	0	0	23	24	1	0	0.03937
Fire Station #7	440	100%	26	0	0	0	0	0	0	0	26	26	0	0	0.03937
Utah Park	430	73%	12	3	0	1	0	0	0	0	16	22	6	0	0.03937
Expo Park	420	91%	18	2	0	0	0	0	0	0	20	22	2	0	0.03937
Kelly Dam	410	96%	21	1	0	0	0	0	0	0	22	23	1	0	0.03937
Van Bibber @ Hwy 93	330	57%	9	0	1	1	1	0	0	0	12	21	9	0	0.03937
Sports Complex	320	93%	12	1	0	0	0	0	0	0	13	14	1	0	0.03937
Guy Hill Ranch	310	100%	6	0	0	0	0	0	0	0	6	6	0	0	0.03937
Van Bibber Park	300	92%	11	1	0	0	0	0	0	0	12	13	1	0	0.03937
Upper Leyden	220	91%	9	1	0	0	0	0	0	0	10	11	1	3	0.03937
Leyden Confluence	210	100%	10	0	0	0	0	0	0	0	10	10	0	0	0.03937
Leyden Reservoir	200	90%	16	2	0	0	0	0	0	0	18	20	2	0	0.03937
Nott Creek	150	100%	5	0	0	0	0	0	0	0	5	5	0	0	0.03937
West Woods	120	94%	15	1	0	0	0	0	0	0	16	17	1	1	0.03937
Ralston Reservoir	110	100%	4	0	0	0	0	0	0	0	4	4	0	1	0.03937
A2-Carr Street	100	83%	14	0	0	1	0	0	0	0	15	18	3	0	0.03937
WX-EPC at Hwy 105	3010	84%	106	9	0	0	1	0	1	116	138	13	0	0.01	
Fairview Peak	4860	98%	54	1	0	0	0	0	0	55	56	1	0	0.01	
A2-Magnolia WX-Precip	6601	100%	117	0	0	0	0	0	0	117	117	0	0	0.01	
A2-Westerly Cr Dam Precip	100240	50%	1	0	1	0	0	0	0	2	4	2	0	0.03937	
A2-Sand Creek at Colfax Precip	100160	95%	19	1	0	0	0	0	0	20	21	1	0	0.03937	
A2-Sellers Gulch at Haystack Precip	100150	42%	5	1	2	2	1	0	0	11	26	15	0	0.03937	
A2-Upper Sellers Gulch Precip	100140	54%	7	3	1	2	0	0	0	13	24	11	0	0.03937	
A2-ETG @ Hampden Precip	100110	96%	21	1	0	0	0	0	0	22	23	1	0	0.03937	
A2-Blackstone Precip	100100	100%	16	0	0	0	0	0	0	16	16	0	0	0.03937	

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