

# Colorado Water Assessment Tracking and Reporting (CO WATR)



By Skip Feeney, Water Quality Control Division



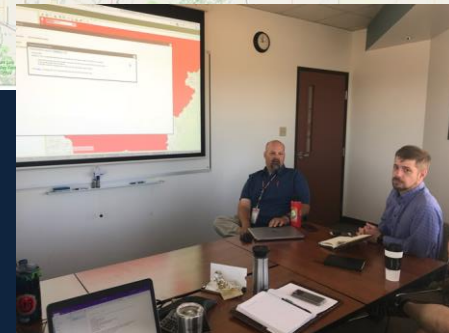
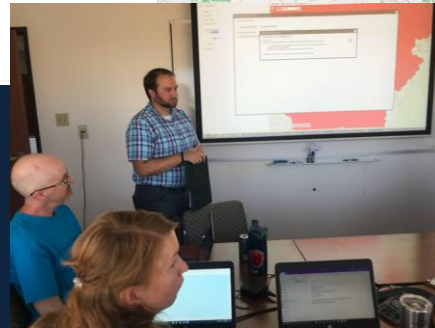
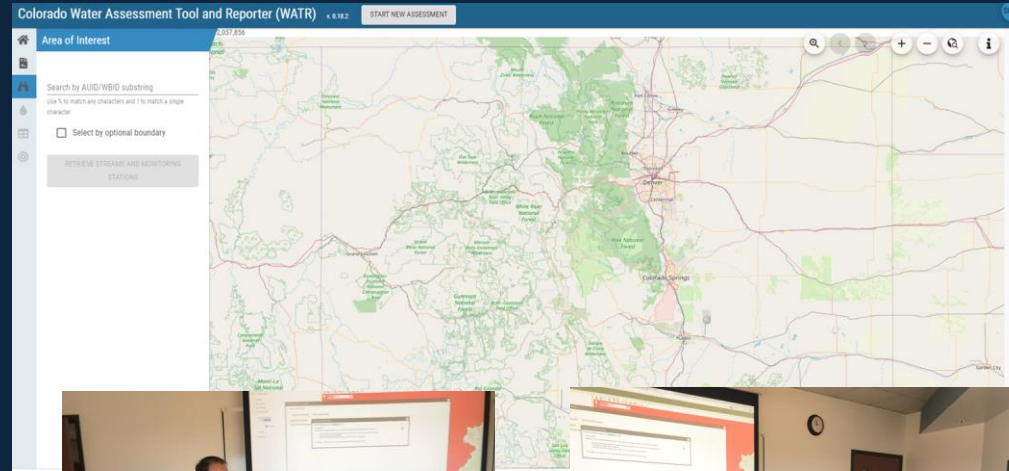
# COWATR

## Colorado Water Assessment Tool and Reporter

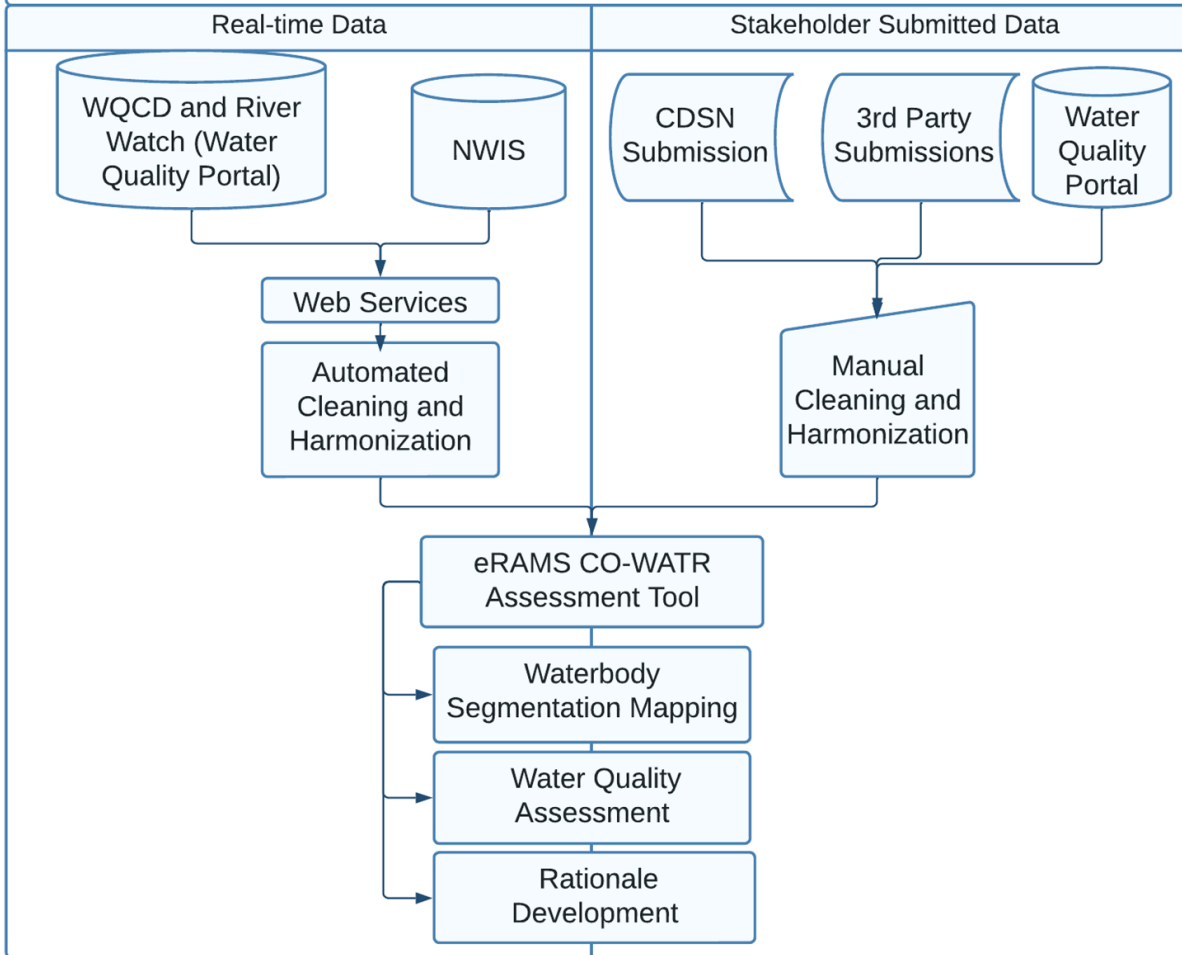
### Background

- Developed by CSU eRams
- Interactive web-based tool
- Assesses against standards
- Generates reports/rationales
- Supports 8 part time assessors and other teams

<https://cdphe303d.erams.com/>



### 303(d) Data Acquisition & Assessment Process



# Annual Data Call Numbers

40 agencies

1000+ stations

150 water bodies

Water Quality Portal, NWIS, CDSN, third party submissions

- 250,000 chem results
- 10 million temperature results
- Macroinvertebrate and sediment data

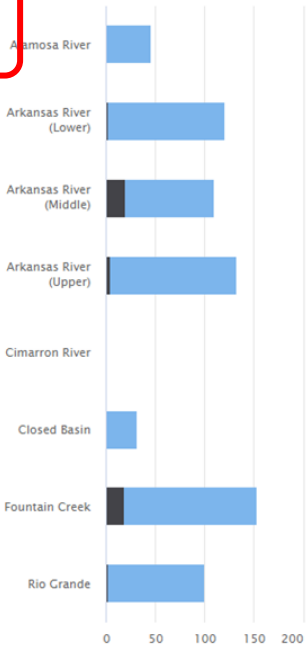
Tracking Registry

Tracking Sheet

Logger

Select a Tracking Sheet for an Assessment Cycle  
2021 Arkansas/Rio Grande

2021 Arkansas/Rio Grande Tracking Sheet



Alamosa River	46 / 46 Sites Completed	15 / 15 Rationales Completed
Arkansas River (Lower)	119 / 121 Sites Completed	22 / 22 Rationales Completed
Arkansas River (Middle)	90 / 110 Sites Completed	22 / 32 Rationales Completed
Arkansas River (Upper)	129 / 133 Sites Completed	23 / 25 Rationales Completed
Cimarron River	1 / 1 Sites Completed	1 / 0 Rationales Completed
Closed Basin	30 / 31 Sites Completed	11 / 11 Rationales Completed
Fountain Creek	134 / 153 Sites Completed	12 / 33 Rationales Completed
Rio Grande	98 / 100 Sites Completed	27 / 27 Rationales Completed



Area of Interest



Search by AUID/WBID substring

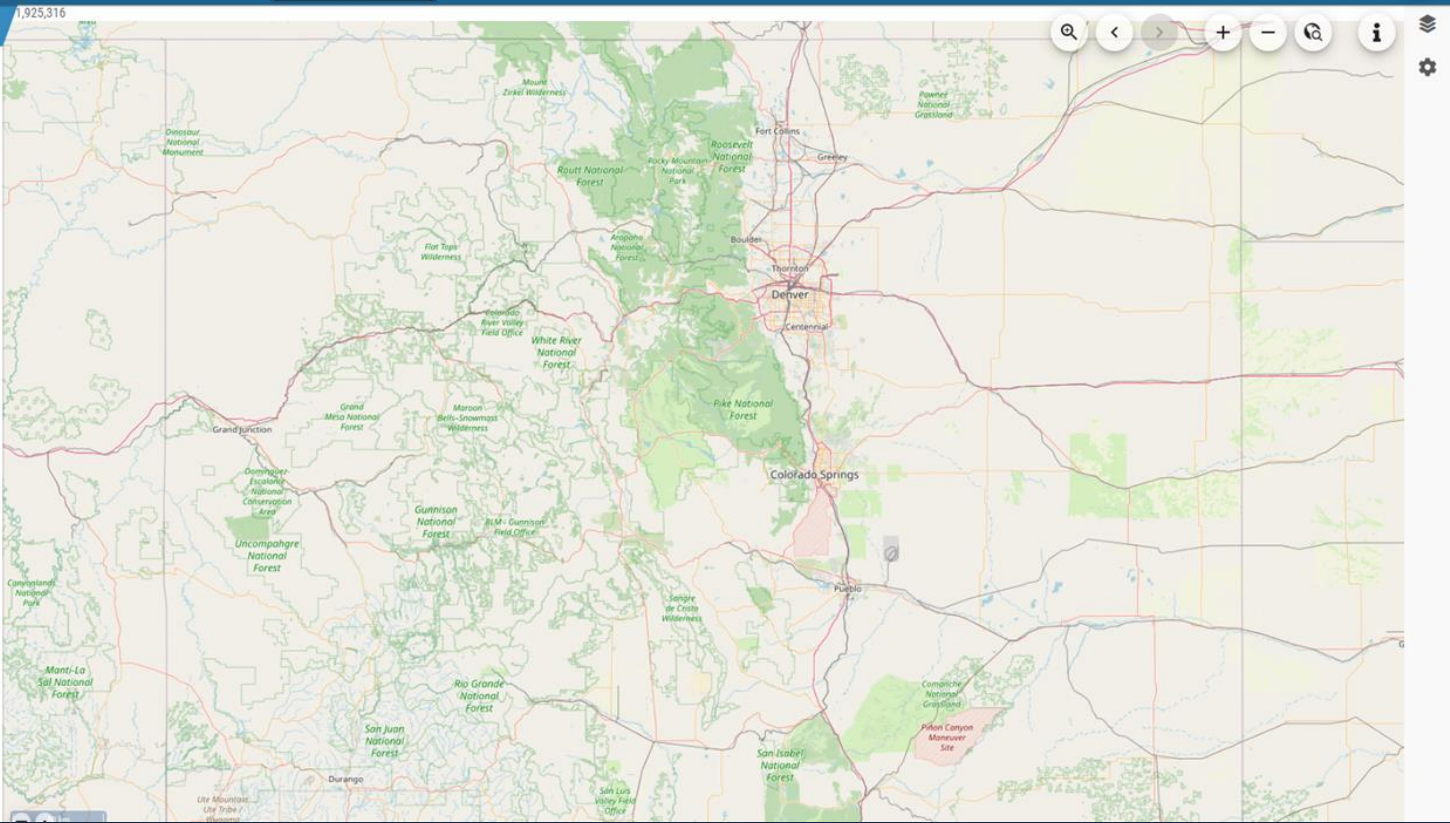
Use % to match any characters and ? to match a single character



Select by optional boundary



RETRIEVE STREAMS AND MONITORING STATIONS



**Station Data Retrieval**

32,936

DOWNLOAD STATIONS IN AREA OF INTEREST

Portion (AUID)  Segment (WBID)

Select a WBID

COUCBL02c

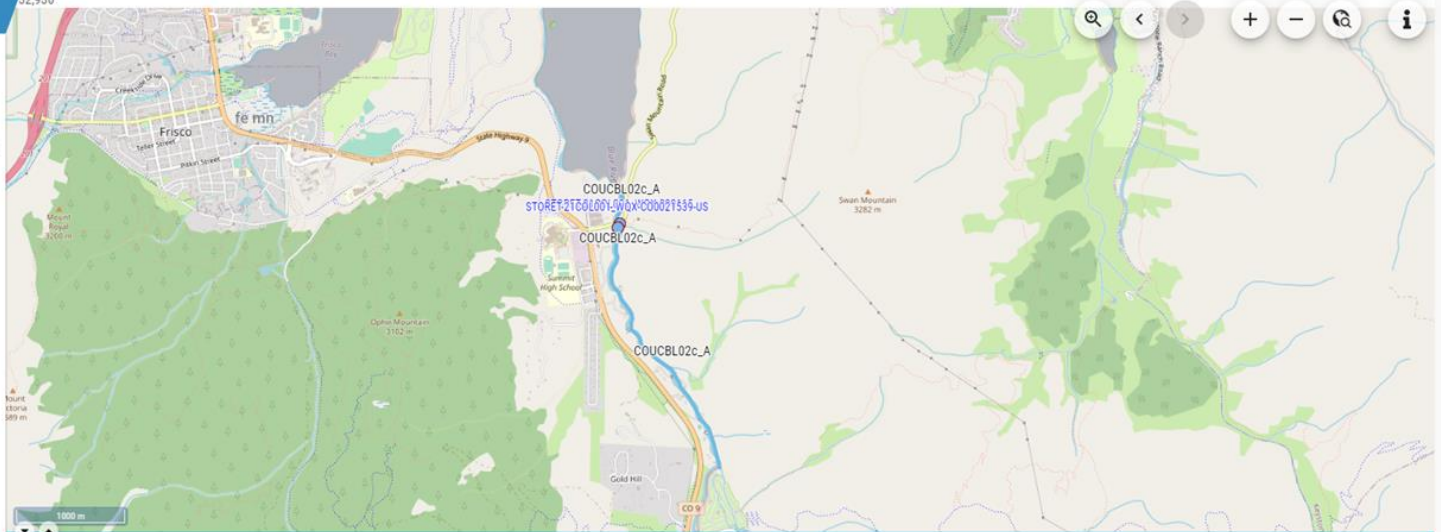
Stream Sites  Lake Sites

Include 3rd party stations

UNSELECT ALL STATIONS

Start: 01/01/2017 End: 12/31/2021

ASSESS SELECTED STATION(S)



Water Quality	303(d) Impairments	305(b) Classifications	Segment Standards	2" Water Supply	Logger	
Analyze	Station Name	Station ID	Database	Organization	Type	Zoom To
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> BLUE R. ABV DILLON RESERVOIR	21COL001_WQX-000115	STORET	Colorado Dept. of Public Health & Er	River/Stream	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> SWQC, station:BRL, Blue River above	21COL001_WQX-C00021539-U/S	STORET	Colorado Dept. of Public Health & Er	River/Stream	



Assessment Results

Analyte	Uses	List	Qualifier	Action
As-T	WS	No	None	None
Zn-D	AC	No	None	None
Zn-D	AA	No	None	None

ADD IMPAIRMENT

UPDATE PROPOSED ACTION (RATIONALE AND ASSESSMENT SUMMARY TABS)

SAVE RATIONALE AND UPDATE TRACKING SHEET

OPTIONAL -- VIEW/EDIT DATASET

OPTIONAL -- DOWNLOAD FINAL ASSESSMENT FILES

Summary of Parameters	Rationale	Assessment Summary	2* Water Supply	Nutrient Summary	E. coli Summary	Ammonia Summary (Acute)	Ammonia Summary (Chronic)	Prime Data	Chronic Data	Acute Data	Paired Calculations	Segment Standards	Notes
Constituent	"J" Flag	Chronic	Acute	Water Supply	Agriculture (TREC)	Existing Quality	# of Samples (n)	Chronic	Acute	Max	Status		Summary
Ni-T	0	NS	NS	100	200	0	9	NA					0.5
Pb-D	10	1.857	47.646	NS	NS	0.128	29	29					0.85
Pb-T	4	NS	NS	50	100	0.212	9	9					0.5
S2-T	0	0.002	NS	0.05	NS	N/A	0	0					0.85
S04-T	0	NS	NS	250	NS	27	29	NA					0.85
Se-D	16	4.6	18.4	NS	NS	0.322	29	29					0.85
Se-T	16	NS	NS	50	20	0.221	29	NA			XTD		0.5
TN-T	17					0.251	74	0			Check Nutrient Summary Tab		0.5
TP-T	15					0.004	62	0			Check Nutrient Summary Tab		0.5
Temp(s) C	0					N/A	0	0			tool does not evaluate		DMs
Temp(w) C	0					N/A	0	0			tool does not evaluate		DMw
U-D	2	NS	NS	NS	NS	0.739	29	29					0.85
U-T	0	NS	NS	30	NS	0.607	9	NA					0.5
Zn-D	4	65.091	124.242	NS	NS	82.4	29	29			Yes, Chronic AQL, Yes, AQL Acute: 3,		0.85
Zn-T	4	NS	NS	5000	2000	35.3	29	NA			XTD		0.5
pH max-D	0	9	NS	9	NS	8.36	29	N/A					0.85
pH min-D	0	6.5	NS	5	NS	8.02	29	N/A					0.15



Water Quality Data

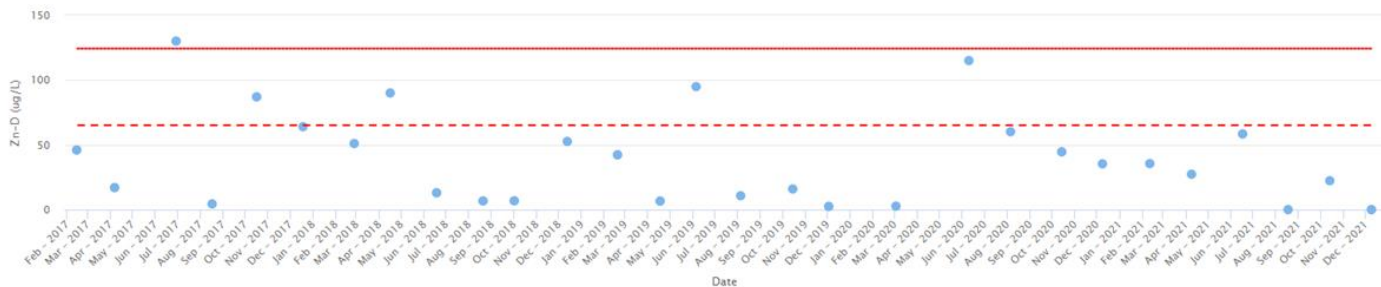
Parameter: Zn-D

DOWNLOAD TIME SERIES SUMMARY

RE-ASSESS STATION DATA

Parameter Summary Station Summary Station Timeseries

Zinc (Dissolved)



Include/Exclude Parameters, by Organization

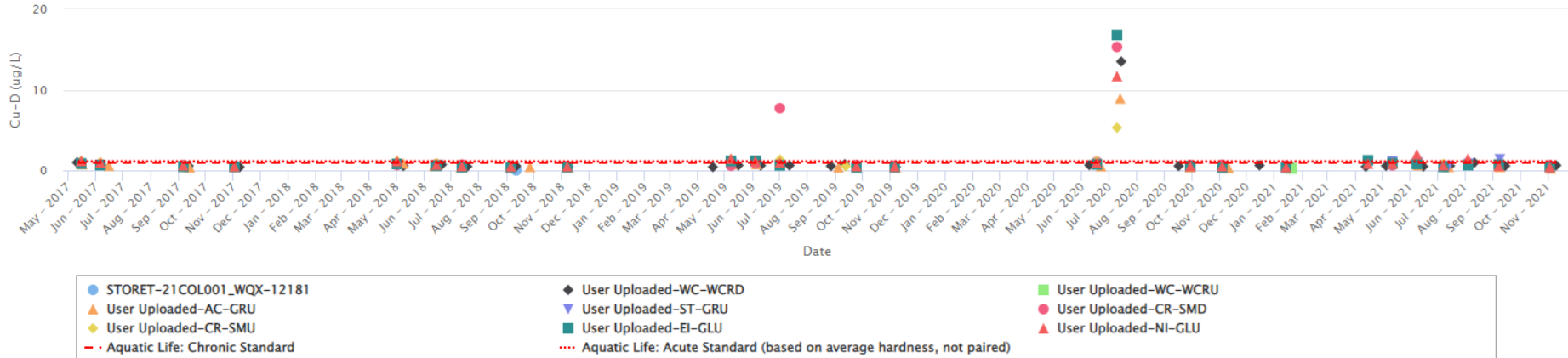
Toggle J Flags to 0:

- Aluminum (Dissolved)
- Aluminum (Total Recoverable)
- Ammonia
- Arsenic (Dissolved)
- Arsenic (Total Recoverable)

Station ID	Date	Parameter	Flag	Value	Units	Include
STORET-21COL001_WQX-000115	2017-02-14 11:15:00	Zinc (Dissolved)		46	ug/L	<input checked="" type="checkbox"/>
STORET-21COL001_WQX-000115	2017-04-06 09:15:00	Zinc (Dissolved)		17	ug/L	<input checked="" type="checkbox"/>
STORET-21COL001_WQX-000115	2017-06-29 09:30:00	Zinc (Dissolved)		130	ug/L	<input checked="" type="checkbox"/>
STORET-21COL001_WQX-000115	2017-08-17 11:45:00	Zinc (Dissolved)	J	4.4	ug/L	<input checked="" type="checkbox"/>
STORET-21COL001_WQX-000115	2017-10-16 11:15:00	Zinc (Dissolved)		87	ug/L	<input checked="" type="checkbox"/>



### Copper (Dissolved)



Assessment Results

Analyte	Uses	List	Qualifier	Action
As-T	WS	No	None	None
Zn-D	AC	No	None	None
Zn-D	AA	No	None	None

ADD IMPAIRMENT

UPDATE PROPOSED ACTION (RATIONALE AND ASSESSMENT SUMMARY TABS)

SAVE RATIONALE AND UPDATE TRACKING SHEET

OPTIONAL - VIEW/EDIT DATASET

OPTIONAL - DOWNLOAD FINAL ASSESSMENT FILES

- Summary of Parameters
- Rationale
- Assessment Summary
- 2" Water Supply
- Nutrient Summary
- E. coli Summary
- Ammonia Summary (Acute)
- Ammonia Summary (Chronic)
- Prime Data
- Chronic Data
- Acute Data
- Paired Calculations
- Segment Standards
- Notes

Standards Attainment Assessment Summary

Portion Waterbody ID:

Portion Description:

Use Classifications:

- Aq Life Cold 1
- Water Supply
- Recreation E
- Agriculture

Period of Record:

01/01/2017 to 12/31/2021

Table 1. Summary of Proposed Action

Affected Use	Analyte	Category/List	Action
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Attainment Summary

Table 2. Water Quality Station Information

Site ID	Site Description	Org	Latitude	Longitude
STORET-21COL001_WQX-C00011939-US	SWQC, station-BRL, Blue River above Dillon Reservoir	Colorado Dept. of Public Health & Environment-WQCD	39.5664000000	-106.0493000000
STORET-21COL001_WQX-000119	BLUE R. ABV DILLON RESERVOIR	Colorado Dept. of Public Health & Environment-WQCD	39.5666600000	-106.0491000000

Table 3. Assessment of Attainment of Acute or One-Day Standards

Parameter	# of Samples	Aquatic Life	Water Supply	Agriculture	# Exceedances
Ag-D ug/L	29	1.26	NS	NS	No
Ag-T ug/L	0	NS	100	NS	No
AL-D ug/L	20	NS	NS	NS	No
AL-T ug/L	9	NS	NS	NS	No
NH3 mg/L	29	4.13	NS	NS	No
As-D ug/L	29	340	NS	NS	No
Cd-D ug/L	29	1.38	NS	NS	No
Cd-T ug/L	9	NS	5	10	No
Cr-D ug/L	20	16	NS	NS	No

# Other Tool Functions

Summary of Parameters	Rationale	Assessment Summary	2" Water Supply	Nutrient Summary	E. coli Summary	Ammonia Summary (Acidic)	Ammonia Summary (Chloric)	Prime Data	Chlorine Data	Acidic Data	Paired Calculations	Segment Standards	Notes
Date	Hardness	Parameter	Value	Flag	Units	TVS	Exceedance?						
2021-04-08	88.1	Pb-D	0	u	ug/L	56.245							
2021-06-16	58.8	Pb-D	0	u	ug/L	36.063							
2021-08-17	80.6	Pb-D	0	u	ug/L	51.026							
2021-10-13	81.7	Pb-D	0	u	ug/L	51.79							
2021-12-08	84.8	Pb-D	0	u	ug/L	53.845							
2017-02-14	89	Zn-D	46		ug/L	143.915							
2017-04-06	91	Zn-D	17		ug/L	146.853							
2017-06-29	58	Zn-D	130		ug/L	97.497							3 year exception
2017-08-17	69	Zn-D	4.4	J	ug/L	114.177							
2017-10-19	73	Zn-D	87		ug/L	136.543							
2017-12-12	51	Zn-D	1		ug/L	121.091							
2018-04-16	74	Zn-D	88		ug/L	87.781							exceeds
2018-06-18	60	Zn-D	13		ug/L	106.55							
2018-08-20	77.6	Zn-D	6.7	J	ug/L	127.049							
2018-10-01	82.7	Zn-D	6.8		ug/L	134.62							
2018-12-12	83.4	Zn-D	52.6		ug/L	135.656							
2019-02-19	85.1	Zn-D	42.3		ug/L	138.168							
2019-04-17	88.5	Zn-D	6.6		ug/L	143.179							
2019-06-05	73.5	Zn-D	54.9		ug/L	120.929							
2019-08-05	56.5	Zn-D	10.7		ug/L	99.787							
2019-10-14	78.1	Zn-D	15.9		ug/L	127.793							

## Acute Paired Hardness Calculations

Date	2-Month Geometric Mean	N	Flag	Value
Jan-Feb 2016	22.7	6		[28.0, 26.9, 15.0, 6.6, 7.16, 0.11, 0]
Mar-Apr 2016	18.3	6		[11.0, 26.0, 0.18, 0.13, 9.20, 0.26, 0]
May-Jun 2016	175.5	6	Exceed	[58.3, 200.3, 300.0, 308.0, 0.7, 0.280, 0]
Jul-Aug 2016	172.2	6	Exceed	[172.0, 230.0, 170.0, 233.0, 170.0, 0.98, 0]
Sep-Oct 2016	170.5	6	Exceed	[190.0, 132.0, 300.0, 0.170, 0.41, 7.460, 0]
Nov-Dec 2016	139.4	6	Exceed	[58.4, 180.0, 240.0, 0.66, 0.34, 0.150, 0]
Jan-Feb 2017	62.3	6		[81.0, 165.5, 260.0, 0.28, 0.23, 0.37, 0]
Mar-Apr 2017	67.8	6		[20.0, 19.0, 0.31, 0.0, 0.579, 3.17, 0.84, 0]
May-Jun 2017	172.1	6	Exceed	[89.0, 200.0, 0.63, 0.117, 0.120, 0]
Jul-Aug 2017	172.1	6	Exceed	[84.0, 179.0, 3.210, 0.230, 0.579, 0.230, 0]
Sep-Oct 2017	172.1	6	Exceed	[34.0, 125.4, 36.0, 0.195, 0.91, 0.52, 0]
Nov-Dec 2017	172.1	6	Exceed	[16.0, 0.71, 1.17, 0.41, 0.19, 1.13, 0]
Jan-Feb 2018	172.1	6	Exceed	[89.7, 370.0, 1.11, 0.9, 0.1, 0.33, 0]
Mar-Apr 2018	172.1	6	Exceed	[19.9, 35.0, 0.42, 0.63, 0.57, 0.210, 0]
May-Jun 2018	44.2	6		[4.36, 0.15, 0.63, 2.60, 0.190, 0]
Jul-Aug 2018	150.2	6		[53.7, 66.0, 360.0, 0.20, 0.160, 0]
Sep-Oct 2018	99.2	6		[84.4, 130.0, 1.50, 0.78, 0.100, 0.65, 0]
Nov-Dec 2018	16.7	4		[74.9, 11.0, 0.15, 9.6, 0]
Jan-Feb 2019	13.5	6		[19.3, 21.0, 6.6, 0.29, 0.5, 0.17, 0]
Mar-Apr 2019	26.3	5		[50.0, 31.0, 0.16, 0.25, 2.20, 0]
May-Jun 2019	94.7	6		[21.0, 56.0, 2.41, 0.178, 0.120, 0.730, 0]
Jul-Aug 2019	111.1	6		[116.1, 74.0, 0.20, 0.894, 2.170, 0.772, 0]
Sep-Oct 2019	122.3	6		[87.0, 434.0, 8.50, 0.180, 0.62, 1.370, 0]

## E.coli Two-Month Geomeans

Date	NH3	pH	Temperature	Salmonid Standard	Exceedance?	No Salmonid Standard	Exceedance?
2017-01-17	0.013	7.80		6.431	N	9.829	N
2017-01-24	0.005	7.4		10.341	N	21.972	N
2017-01-29	0.006	7.03		10.024	N	16.338	N
2017-03-08	0.004	7.6		11.375	N	17.032	N
2017-03-09	0.05	7.45		14.296	N	21.406	N
2017-03-14	0.005	7.61		6.673	N	6.992	N
2017-04-05	0.005	8.03		5.356	N	6.019	N
2017-04-11	0.004	8		5.615	N	6.408	N
2017-04-12	0.007	7.8		7.412	N	11.888	N
2017-04-19	0.007	7.4		8.107	N	12.199	N
2017-04-23	0.004	7.8		8.107	N	12.658	N
2017-04-26	0.003	7.8		8.107	N	12.658	N
2017-05-11	0.005	7.2		8.107	N	12.658	N
2017-05-15	0.003	7.2		17.506	N	20.214	N
2017-05-17	0.003	7.1		21.945	N	22.881	N
2017-05-25	0.004	7.8		8.107	N	12.139	N
2017-06-06	0.002	7.33		21.394	N	22.025	N
2017-06-07	0.002	7.59		19.942	N	17.867	N
2017-06-15	0.002	7		24.103	N	30.993	N
2017-06-22	0.003	7.68		10.099	N	10.962	N
2017-07-05	0.002	7.8		8.107	N	12.139	N
2017-07-06	0.004	7.32		16.957	N	25.392	N
2017-07-12	0.004	7.1		21.945	N	22.881	N

## Ammonia Calculations

Nutrients	Stds	Year 2016	Year 2017	Year 2018	Year 2019	Year 2020	Notes
TN mg/L	2.01	12\0.2175	12\1.78775	13\2.06	14\2.0675	13\2.06	
TP mg/L	0.17	12\0.28625	12\0.278	13\0.209	14\0.24775000000000003	13\0.172	
Chlor a. mg/m2	150						

## Nutrient Calculations