

# Synoptic CB and TEMPEST Aquifer: Porewater SO<sub>4</sub>/Cl

May 2025 and Aquifer Well Test Samples

2025-11-07

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##Add Required Packages

## 0.1 Run Information

```
##### Run information - PLEASE CHANGE
Date_Run = "2025-09-24" #Date that instrument was run
Run_by = "Zoe Read" #Instrument user
Script_run_by = "Zoe Read" #Code user
run_notes = "Std 1 values are lower than the expected concentration - why is this?
I have seen this with most of our recent runs.
2 dups had high CV for Cl: 120_TEMPEST_AqWell_20250904_1225_C, 80_SWH_202505_UP_LysB_10cm
1 spk had high recovery (122% compared to the 120% cutoff): 101_SWH_202505_TR_LysC_10cm
" #any notes from the run
samples <- c("GCW", "GWI", "MSM", "SWH") #whatever identifies your samples within the same names
samples_pattern <- paste(samples, collapse = "|")
#samples_pattern <- "GCW" #use this instead of the line above if you have only one site code

##### File Names - PLEASE CHANGE
#file path and name for raw summary data file
raw_file_name_cl = "Raw Data/COMPASS_Synoptic_CB_MonMon_202505_C1.txt"
raw_file_name_so4 = "Raw Data/COMPASS_Synoptic_CB_MonMon_202505_S04.txt"

#file path and name of processed data file
processed_file_name = "Processed Data/COMPASS_SynopticCB_PW_Processed_C1_S04_202505.csv"

##### Log Files - PLEASE CHECK
#downloaded metadata csv - downloaded from Google drive as csv for this year
Raw_Metadata = "Raw Data/COMPASS_SynopticCB_PW_SampleLog_2025.csv"

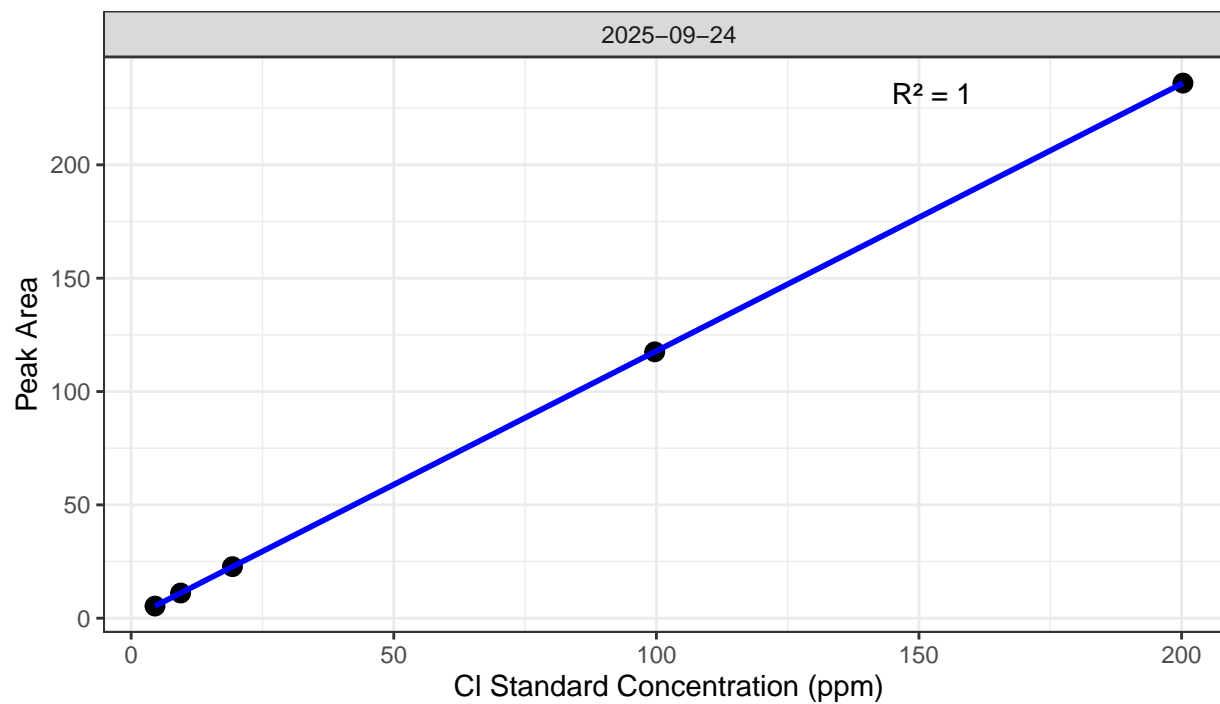
#qaqc log file path for this year
Log_path = "Raw Data/COMPASS_Synoptic_C1_S04_QAQClog_2024.csv"
```

##Set Up Code - constants and QAQC cutoffs

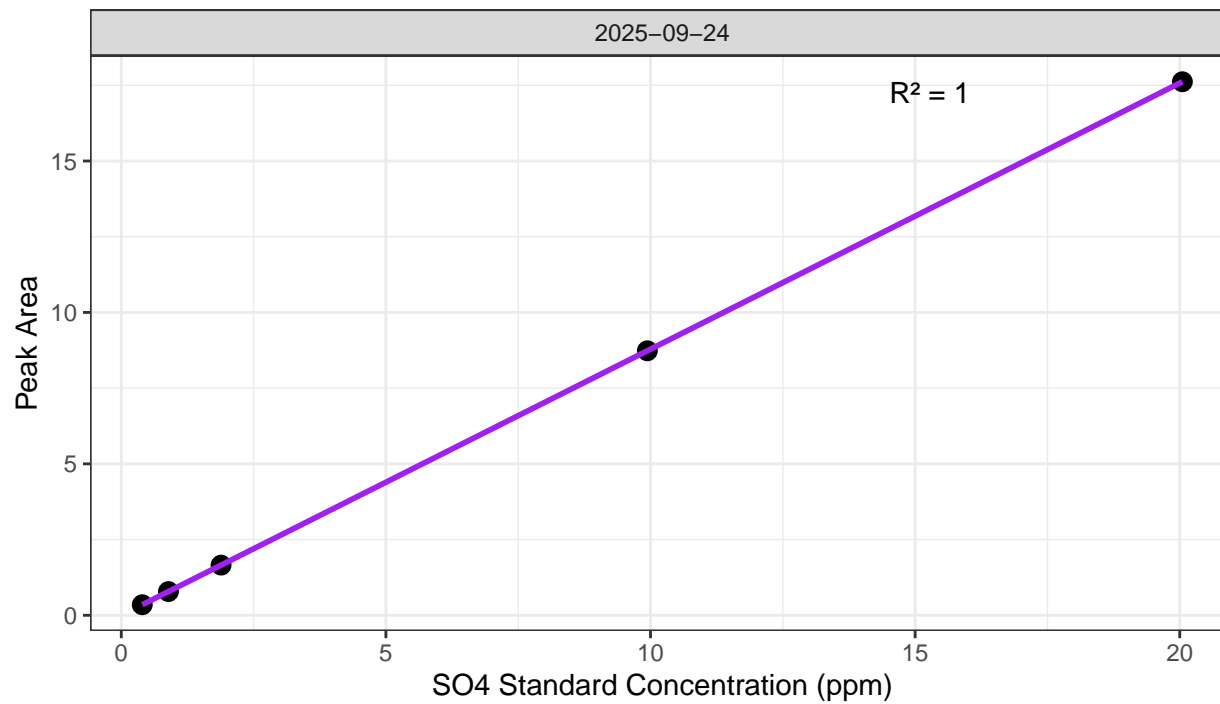
##Import Sample Data

## 0.2 Assess Standard Curves

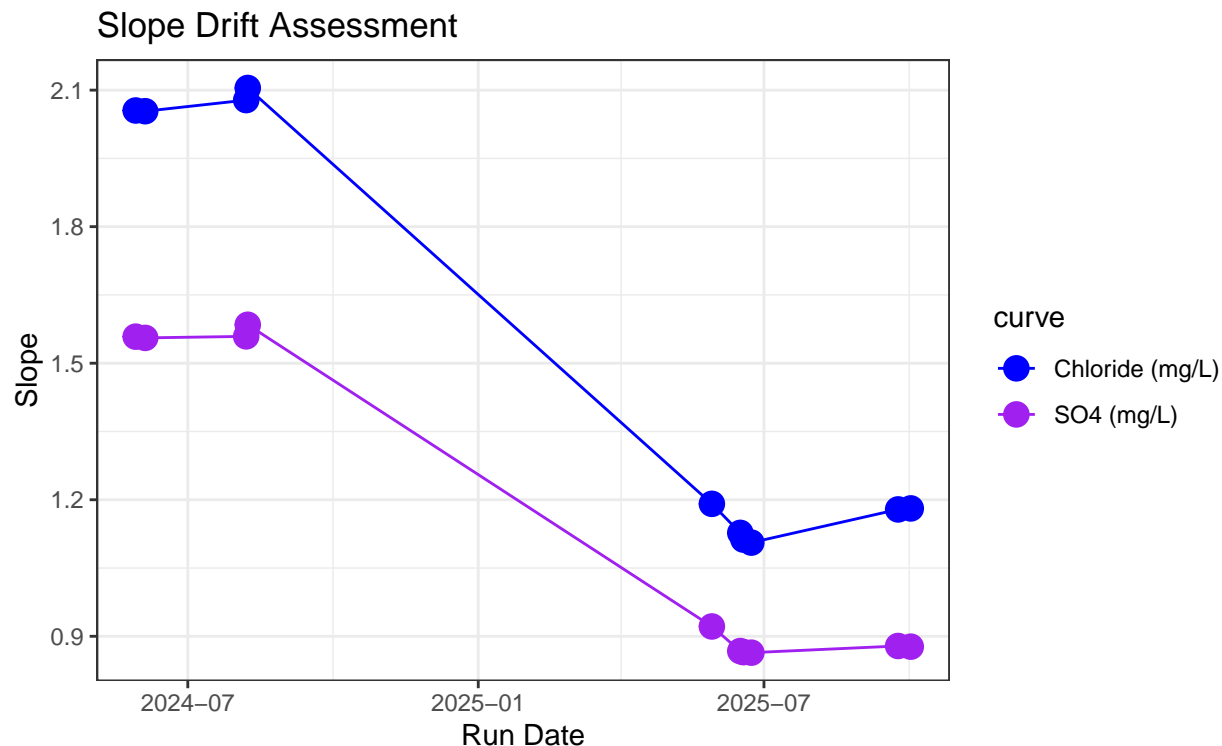
Chloride Std Curve



Sulfate Std Curve



```
## [1] "QAQC log file exists and has been read into the code."
```



```
## [1] "Cl Curve r2 GOOD"
```

```
## [1] "SO4 Curve r2 GOOD"
```

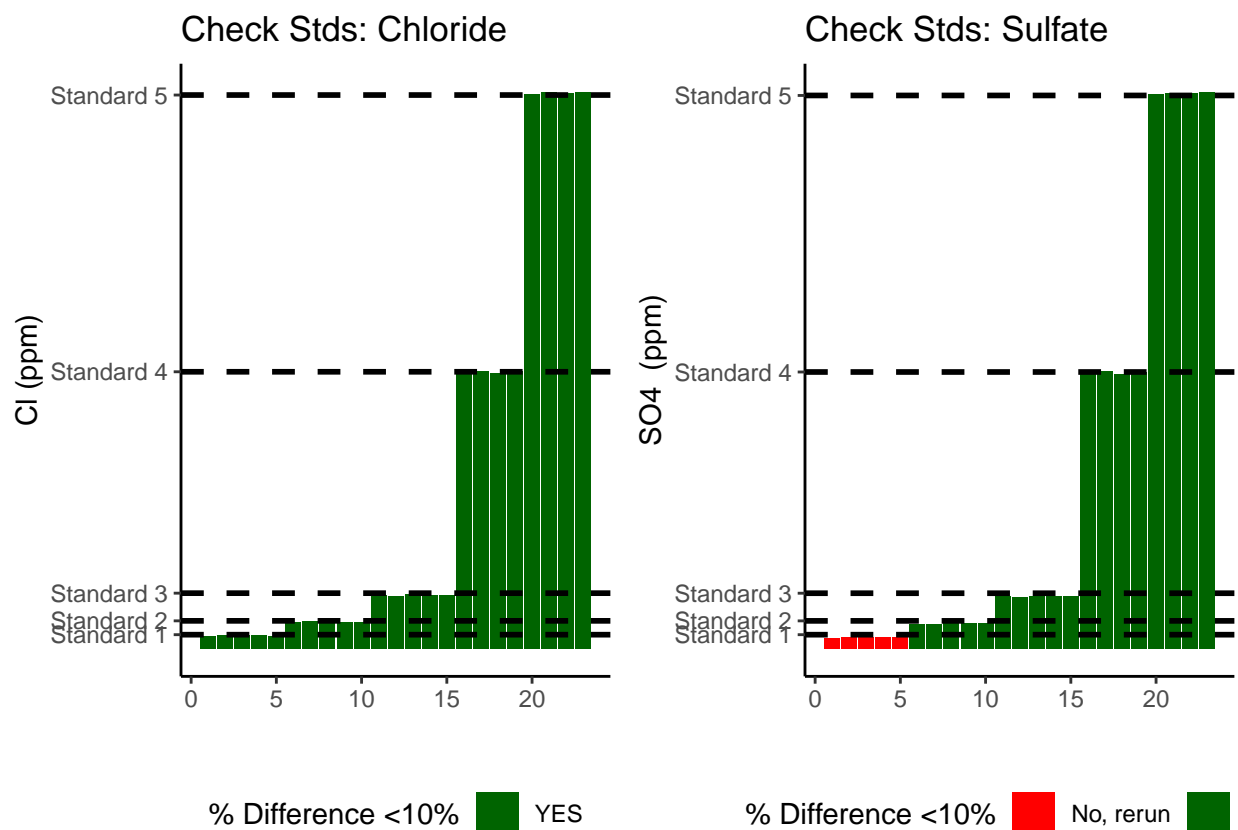
### 0.3 Assess Check Standards

```
## # A tibble: 5 x 5
##   sample_ID mean_Cl sd_Cl   cv_Cl flag_Cl
##   <chr>      <dbl> <dbl>   <dbl> <chr>
## 1 Standard 1    4.68 0.125 0.0267 Chloride Check Standard RSD within Range - P~
## 2 Standard 2    9.59 0.206 0.0215 Chloride Check Standard RSD within Range - P~
## 3 Standard 3   19.3 0.236 0.0122 Chloride Check Standard RSD within Range - P~
## 4 Standard 4  100. 0.453 0.00454 Chloride Check Standard RSD within Range - P~
## 5 Standard 5  201. 0.450 0.00224 Chloride Check Standard RSD within Range - P~
```

```
## # A tibble: 5 x 5
##   sample_ID mean_SO4 sd_SO4   cv_SO4 flag_SO4
##   <chr>      <dbl> <dbl>   <dbl> <chr>
## 1 Standard 1    0.407 0.00769 0.0189 Sulfate Check Standard RSD within Range --
## 2 Standard 2    0.904 0.00754 0.00834 Sulfate Check Standard RSD within Range --
## 3 Standard 3    1.89 0.0107 0.00566 Sulfate Check Standard RSD within Range --
## 4 Standard 4    9.98 0.0454 0.00455 Sulfate Check Standard RSD within Range --
## 5 Standard 5   20.1 0.0378 0.00188 Sulfate Check Standard RSD within Range --
```

```
## [1] ">80% of Chloride Check Standards have RSD within range - PROCEED"
```

```
## [1] ">80% of Sulfate Check Standards have RSD within range - PROCEED"
```



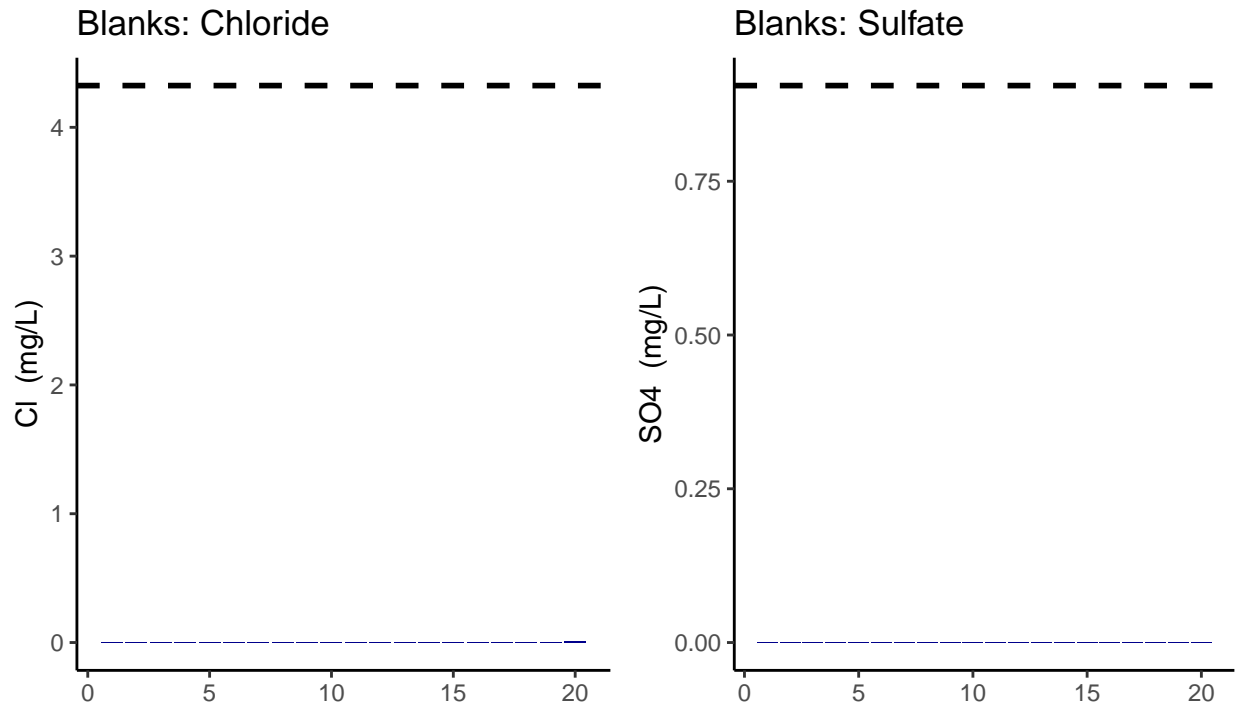
```
## [1] ">80% of Chloride Check Standards are within range of expected concentration - PROCEED"
```

```
## [1] "<80% of Sulfate Check Standards are within range of expected concentration - REASSESS"
```

#### 0.4 Assess Blanks

```
## [1] ">80% of Chloride Blank concentrations are lower 25% quartile of samples"
```

```
## [1] ">80% of Sulfate Blank concentrations are lower 25% quartile of samples"
```



Blank Conc <25% Quartile Samples ■ YE

Blank Conc <25% Quartile Samples ■ Y

```
## Chloride blanks mean ppm:
```

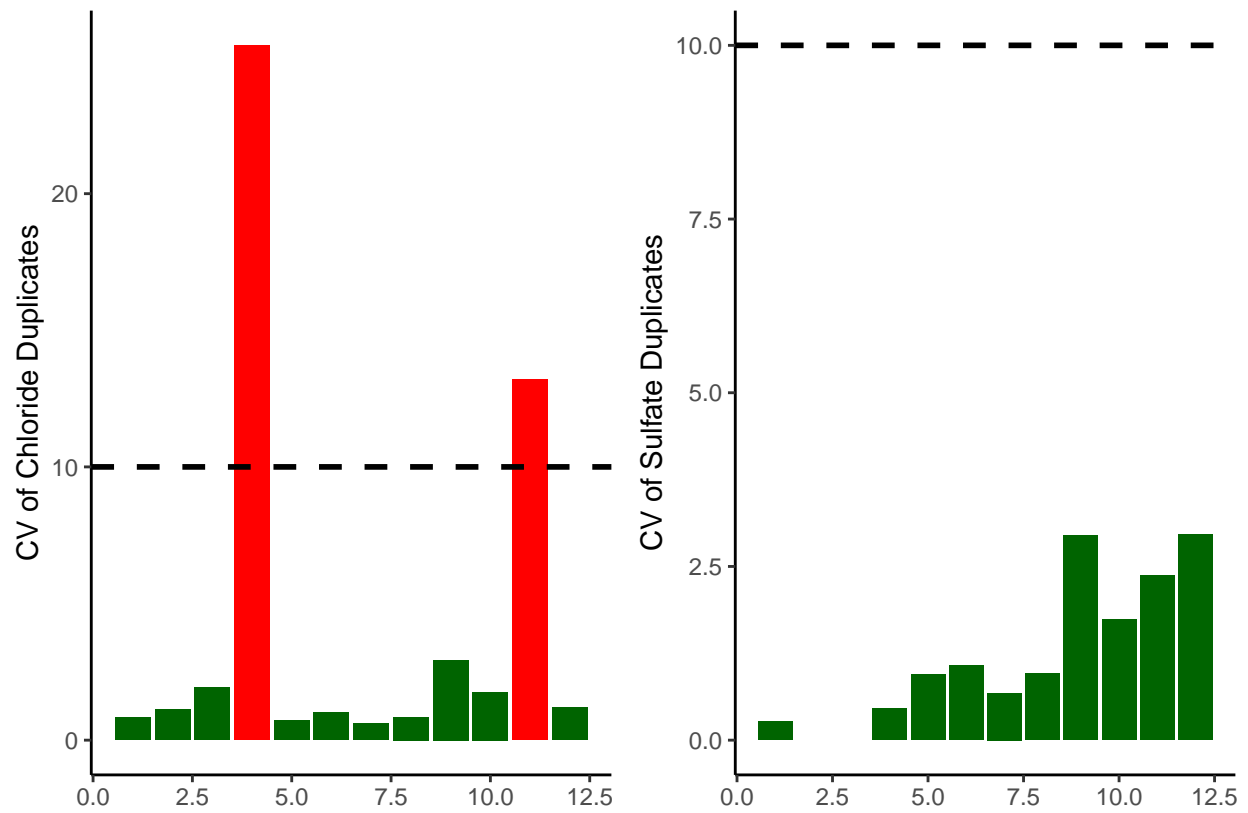
```
## [1] 0.000495
```

```
## Sulfate blanks mean ppm:
```

```
## [1] 3e-05
```

## 0.5 Assess Duplicates

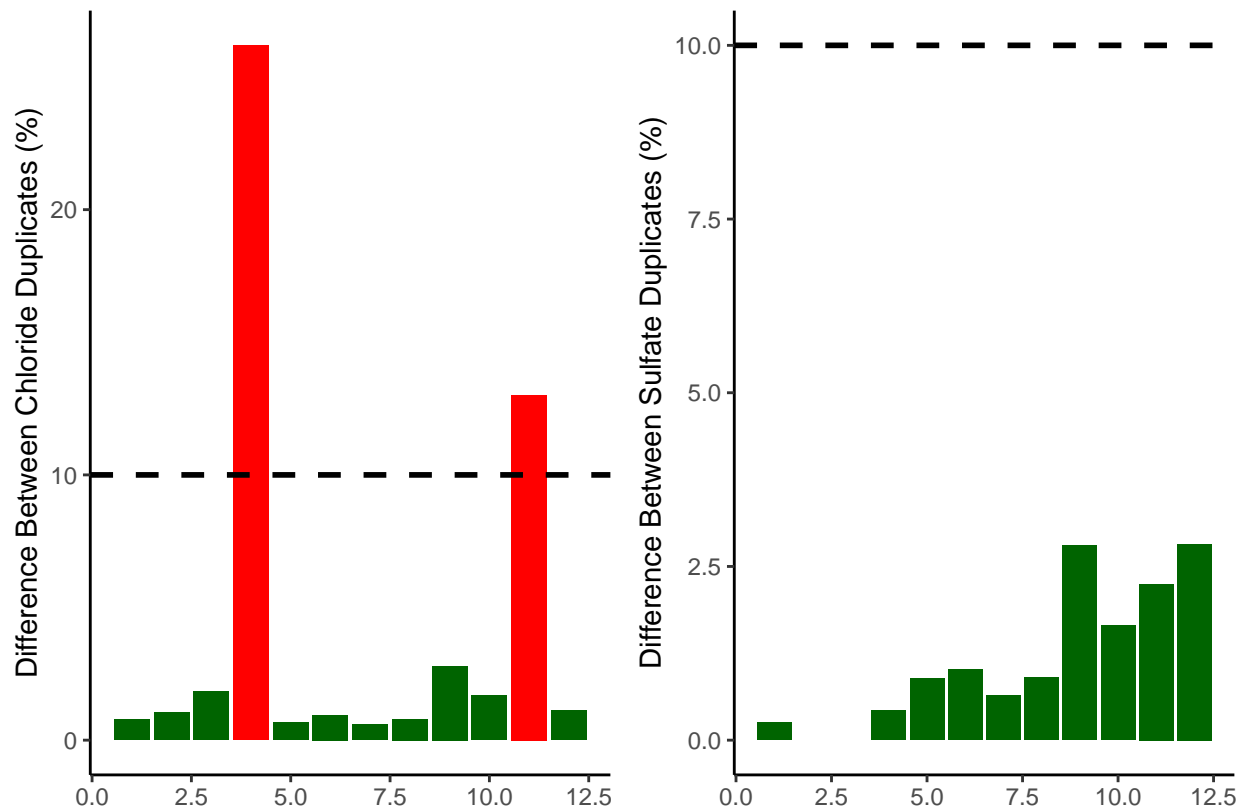
```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## ('geom_bar()').
```



```
## [1] ">80% of Chloride Duplicates have a CV <10% - PROCEED"
```

```
## [1] ">80% of Sulfate Duplicates have a CV <10% - PROCEED"
```

```
## Warning: Removed 2 rows containing missing values or values outside the scale range
## ('geom_bar()').
```



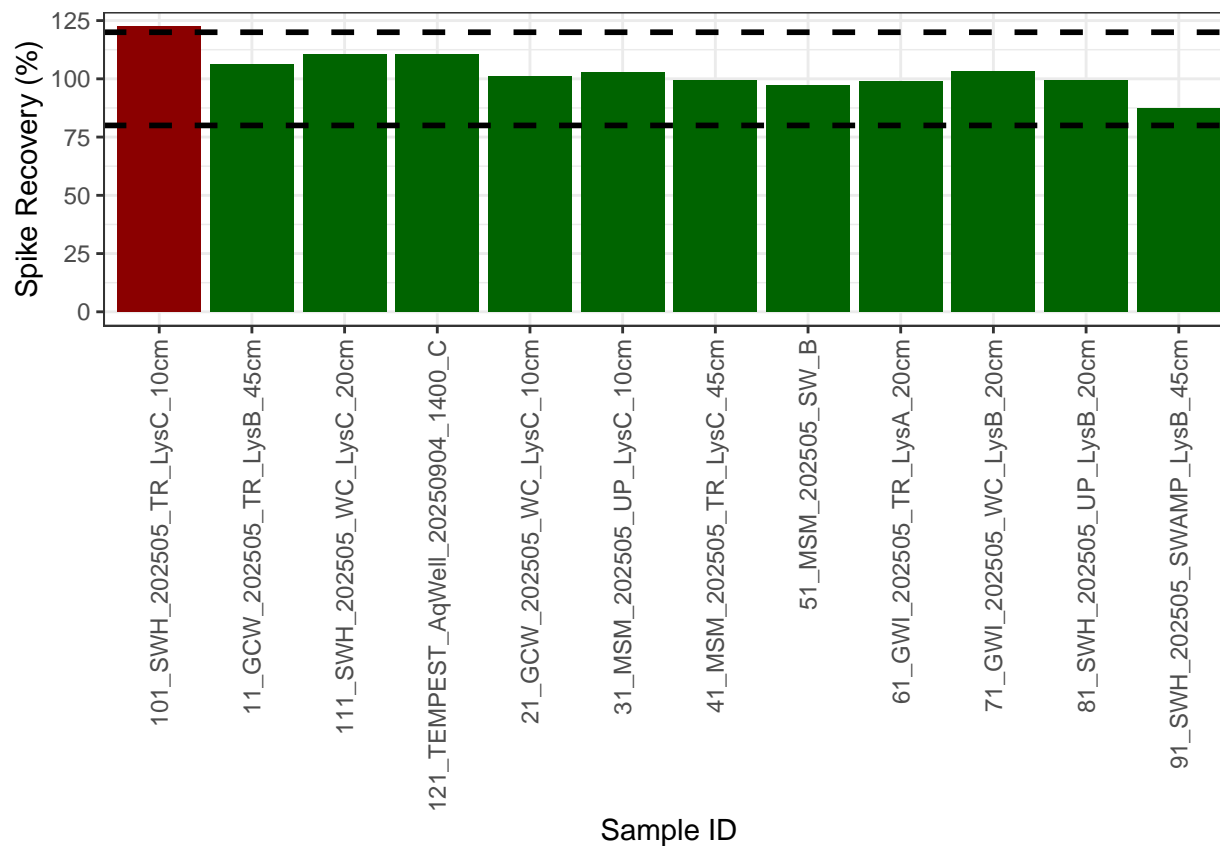
```
## [1] ">80% of Chloride Duplicates have a percent difference <10% - PROCEED"
```

```
## [1] ">80% of Sulfate Duplicates have a percent difference <10% - PROCEED"
```

```
##Calculate mmol/L concentrations & salinity, add dilutions
```



## 0.6 Assess Analytical Spikes



```
## [1] ">80% of S04 spikes have a recovery between the high and low cutoff - PROCEED"
```

## 0.7 Check if samples within the range of the standard curve

```
## Sample Flagging
```

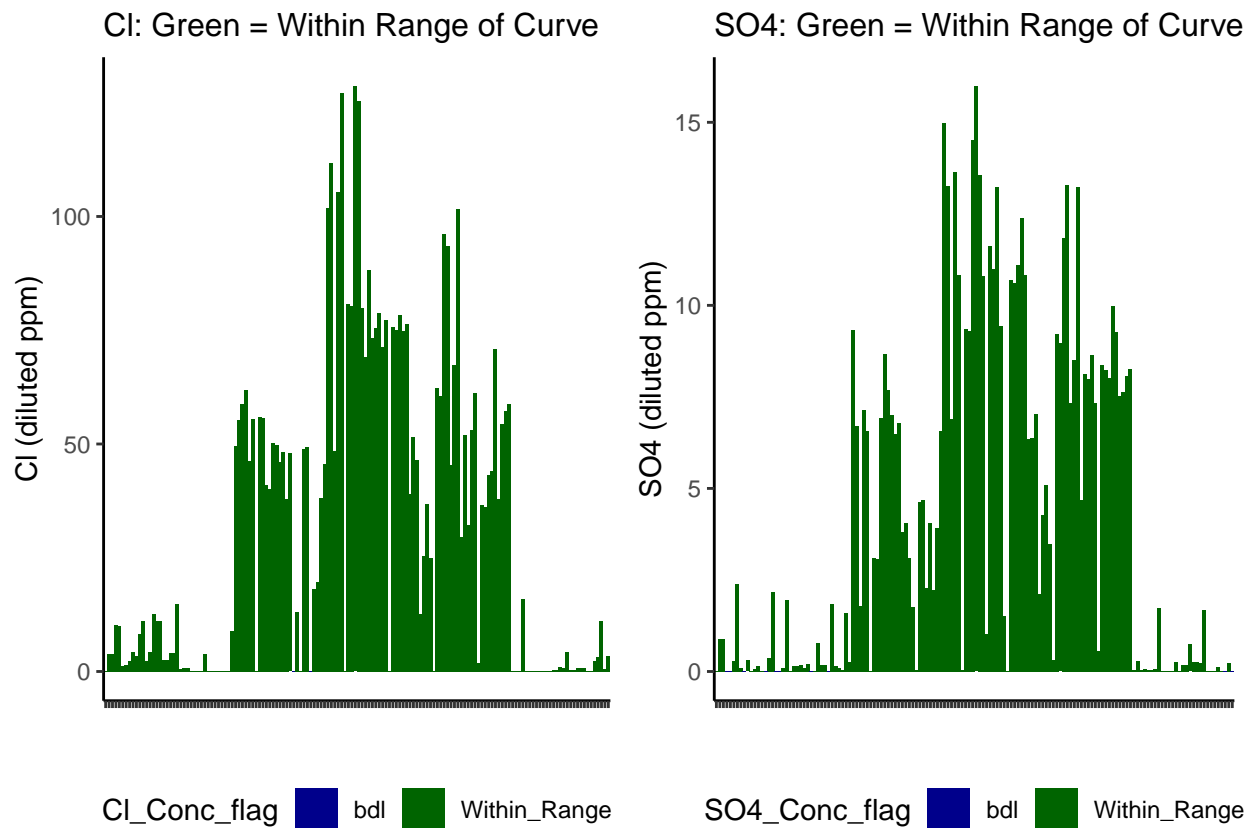


Table 1: SO4 samples

SO4_Conc_flag	Percent_samples
Within_Range	93.243243
bdl	6.756757

Table 2: Cl samples

Cl_Conc_flag	Percent_samples
Within_Range	98.648649
bdl	1.351351

## 0.8 Export Processed Data

#end