Appendix D – Output from R for t-tests comparing populations in Cl – Br data

Comparing group with high Cl concentrations versus the main group of samples. Do the **three** samples with Cl > 15 come from a different population than the remainder of the samples?

```
Welch Two Sample t-test

data:  main_hi_ratio[, 9] and hi_Cl[, 9]
t = -8.4963, df = 2.1364, p-value = 0.01108
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -23.672265  -8.389735
sample estimates:
mean of x mean of y
 3.302333 19.333333
```

Yes, the two groups have different means, and the high Cl group is a different population. However, there is no geologic reason to reject these for use in the CMB analysis.

Comparing group with high C/Br molar ratio versus main group of samples. Do the **four** samples with molar Cl/Br > 294 come from a different population. These four are clearly visually distinct on the scatter plot (**Figure 30**).

```
Welch Two Sample t-test

data:  main_hi_Cl[, 12] and hi_ratio[, 12]
t = -3.6831, df = 3.086, p-value = 0.03307
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -467.2226  -37.7214
sample estimates:
mean of x mean of y
 140.2555  392.7275
```

Yes, the four samples have a higher mean Cl/Br ratio and define a different population. This may be an effect of hydrothermal water contribution or localized anthropogenic contamination.