Ashfield 2021-2022 XRD analyses

Sample lists

```
## --+-- Random powder XRD sample list --+--
##            filename objectname
## 1          S14.csv        S14
## 2          S15.csv        S15
## 3          S16.csv        S16
## 4          S17.csv        S17
## 5          S22.csv        S22
## 6          S24.csv        S24
## 7          S25.csv        S25
## 8          S31.csv        S31
## 9     Sample_01.csv       S_01
## 10  Sample_3_G4.csv     S_3_G4
## 11  Sample_4_G4.csv     S_4_G4
## 12    Sample_A.csv        S_A
## 13    Sample_B.csv        S_B
## 14    Sample_D.csv        S_D
##
## --+-- Oriented clay XRD sample list --+--
##                       filename   objectname
## 1          ENVT4461 S-01 Mg.csv      S01_Mg
## 2      ENVT4461 S-01 Mg+Gly.csv  S01_Mg+Gly
## 3  ENVT4461 S-12 Heated-400.csv S12_Heat400
## 4  ENVT4461 S-12 Heated-550.csv S12_Heat550
## 5          ENVT4461 S-12 Mg.csv      S12_Mg
## 6      ENVT4461 S-12 Mg+Gly.csv  S12_Mg+Gly
## 7  ENVT4461 S-13 Heated-400.csv S13_Heat400
## 8  ENVT4461 S-13 Heated-550.csv S13_Heat550
## 9          ENVT4461 S-13 Mg.csv      S13_Mg
## 10     ENVT4461 S-13 Mg+Gly.csv  S13_Mg+Gly
## 11         ENVT4461 S-14 Mg.csv      S14_Mg
## 12     ENVT4461 S-14 Mg+Gly.csv  S14_Mg+Gly
## 13 ENVT4461 S-15 Heated-400.csv S15_Heat400
## 14 ENVT4461 S-15 Heated-550.csv S15_Heat550
## 15         ENVT4461 S-15 Mg.csv      S15_Mg
## 16     ENVT4461 S-15 Mg+Gly.csv  S15_Mg+Gly
## 17 ENVT4461 S-16 Heated-400.csv S16_Heat400
## 18 ENVT4461 S-16 Heated-550.csv S16_Heat550
## 19         ENVT4461 S-16 Mg.csv      S16_Mg
## 20     ENVT4461 S-16 Mg+Gly.csv  S16_Mg+Gly
```

Random powder data object list

```
##  [1] "S_01_pXRD"   "S_3_G4_pXRD" "S_4_G4_pXRD" "S_A_pXRD"    "S_B_pXRD"
##  [6] "S_D_pXRD"    "S14_pXRD"    "S15_pXRD"    "S16_pXRD"    "S17_pXRD"
## [11] "S22_pXRD"    "S24_pXRD"    "S25_pXRD"    "S31_pXRD"
```
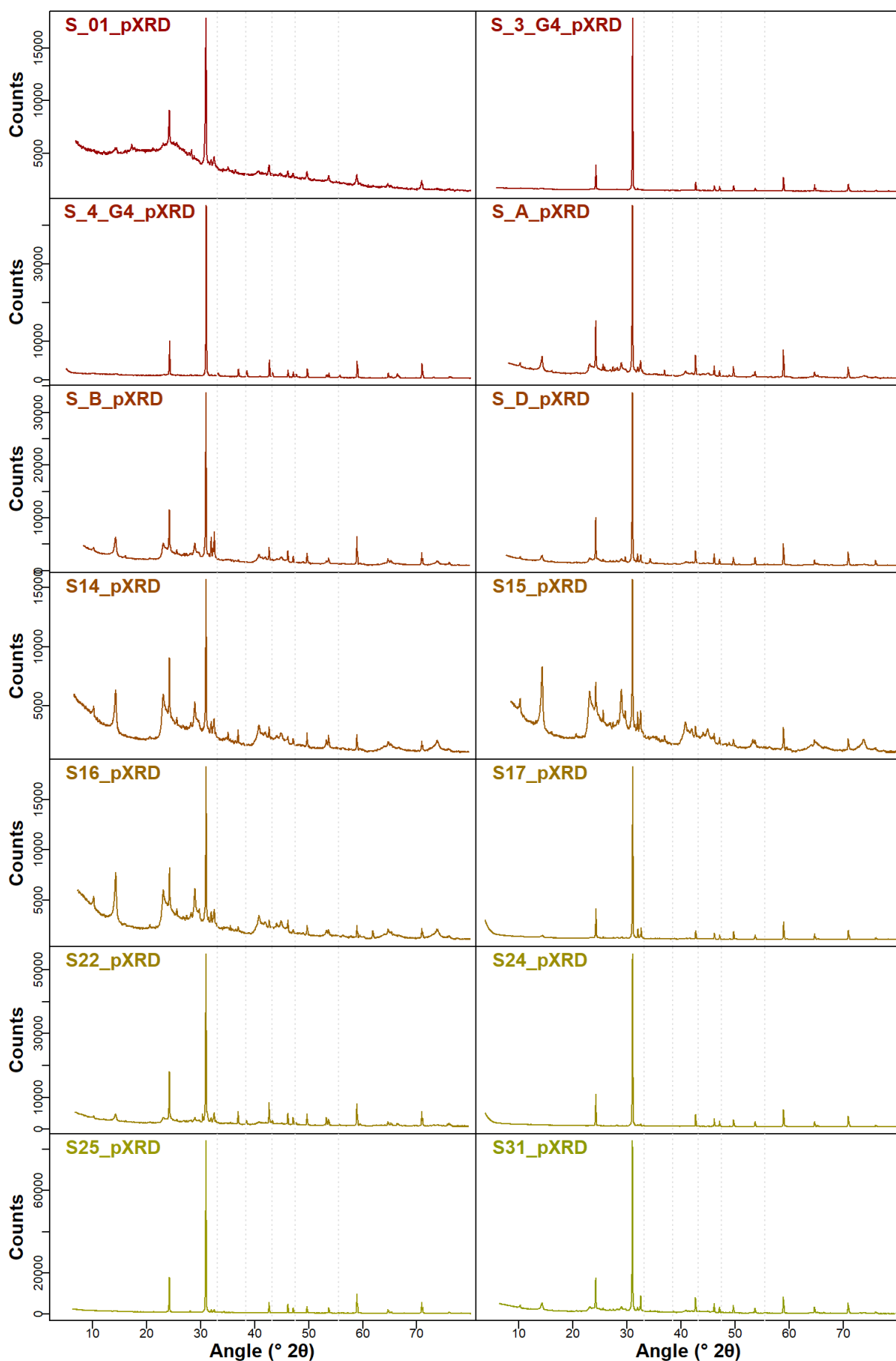
Figure 1: Random powder XRD patterns for selected Ashfield Flats samples. [Samples containing pyrite: S_4_G4, S22, and S31; vertical dotted lines are main pyrite peak angles with Co K-α1 x-rays.]
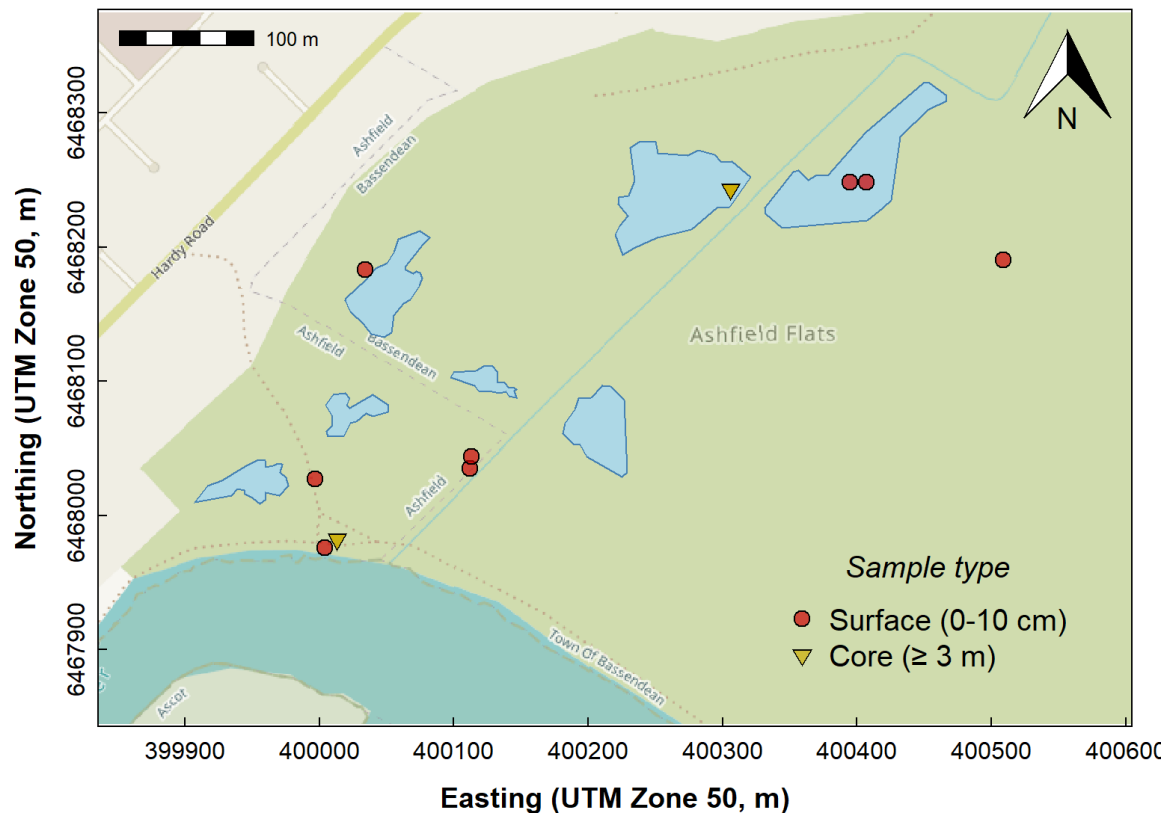
Figure 2: Map of locations for samples containing pyrite detectable by XRD at Ashfield Flats 2021-2022

List of clay plate data objects

```
##  [1] "CP_S01_Mg"      "CP_S01_Mg+Gly"  "CP_S12_Heat400" "CP_S12_Heat550"
##  [5] "CP_S12_Mg"      "CP_S12_Mg+Gly"  "CP_S13_Heat400" "CP_S13_Heat550"
##  [9] "CP_S13_Mg"      "CP_S13_Mg+Gly"  "CP_S14_Mg"      "CP_S14_Mg+Gly"
## [13] "CP_S15_Heat400" "CP_S15_Heat550" "CP_S15_Mg"      "CP_S15_Mg+Gly"
## [17] "CP_S16_Heat400" "CP_S16_Heat550" "CP_S16_Mg"      "CP_S16_Mg+Gly"
```
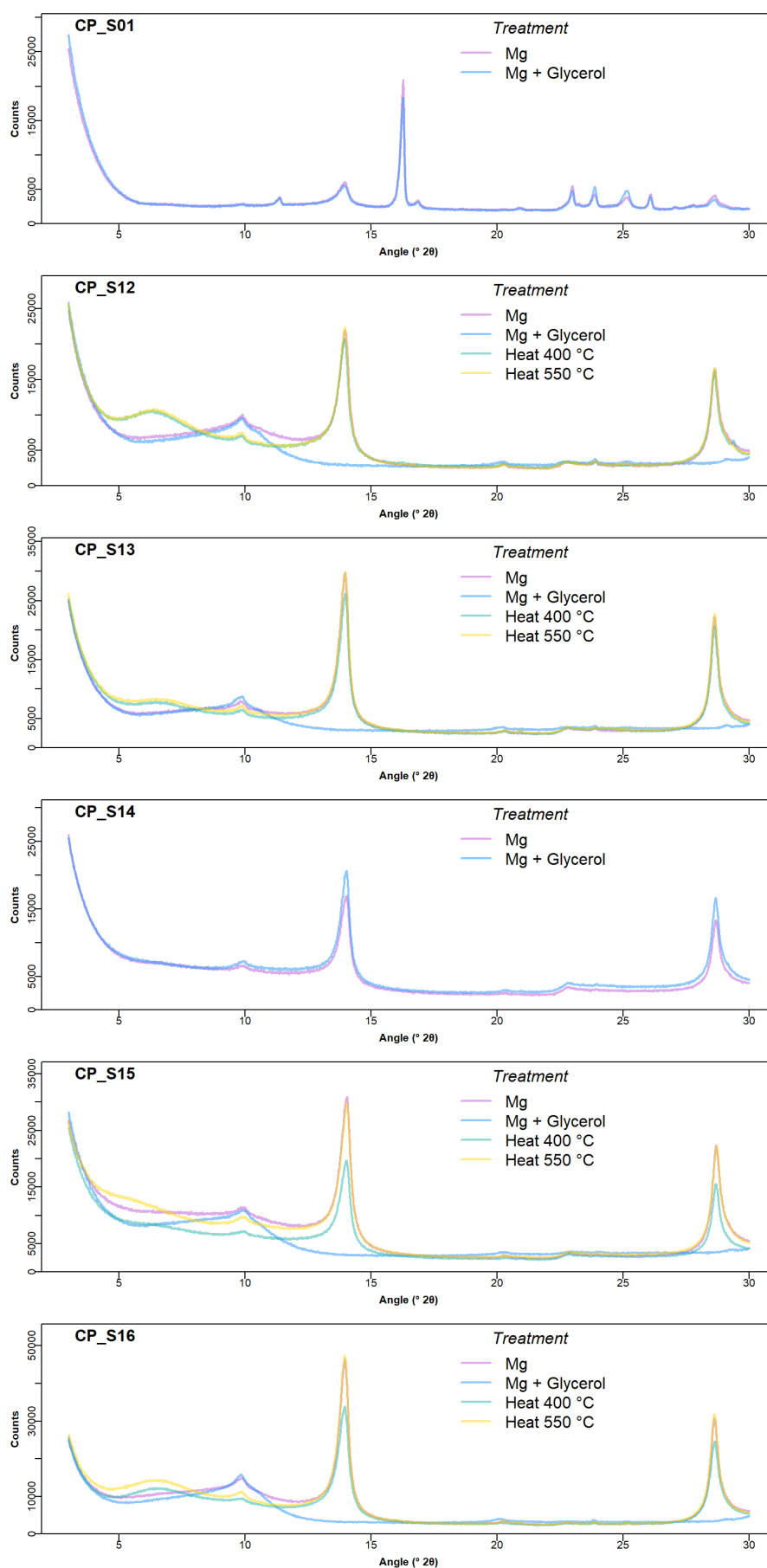
Figure 3: Oriented clay plate XRD patterns for selected samples from Ashfield Flats 2022, showing changes with standard sample treatments.

Sample	Kaolinite	Illite	Vermiculite	Smectite	Boehmite	Gibbsite	Jarosite	Quartz	Heulandite	Calcite	Albite
S12	S	S	S	-	-	-	-	-	-	-	-
S13	S	S	M	-	-	-	-	-	-	-	-
S14	S	M	-	-	-	-	-	-	-	-	-
S15	S	S	M	M	-	-	-	-	-	-	-
S16	S	S	S	-	-	-	-	-	-	-	-
S17	S	W	M	-	-	-	-	-	-	-	-
S22	S	S	-	-	-	-	-	-	-	-	-
S23	S	M	p	-	-	-	-	-	-	-	-
S24	S	W	-	-	M	M	M	S	M	-	-
S25	W	-	-	-	S	W	-	M	M	M	W
S26	S	M	-	p	-	-	-	-	-	-	-
S01	M	W	-	-	S	W	-	W	M	W	-
S29	S	S	p	-	S	M	-	-	-	-	-
S30	W	-	-	-	-	-	-	-	-	-	-
S31	S	S	S	-	-	-	-	-	-	-	-
S_A	S	M	-	-	-	-	-	-	-	-	-
S_B	S	M	-	-	-	-	-	-	-	-	-
S_C	S	M	-	p	-	-	-	-	-	-	-
S_D	S	M	M	-	W	-	W	-	-	-	-
S_E	S	S	S	-	-	-	-	-	-	-	-

That's it so far