

## Appendix I: Spray Residue Analysis

Samples of residue sprayed on the walls and ceiling of the mechanical room were collected for chemical composition analysis.

Technical Safety BC scraped residue off vertical wall surfaces from three locations and a one-inch outer layer of finished drywall was taken from two ceiling locations. The locations are labeled in Figure I-1.

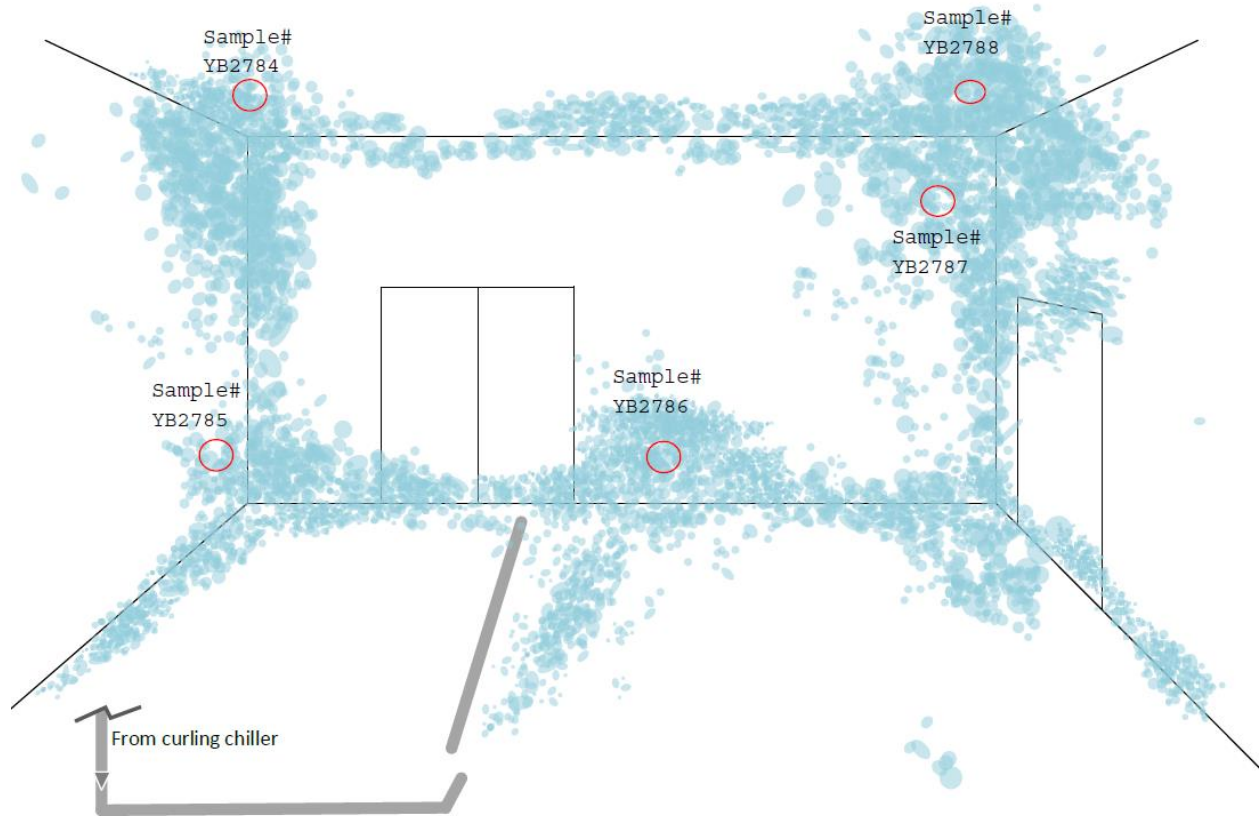
Samples were tested by a laboratory using energy dispersive X-ray spectrometry (EDS).

### EDS Results

Laboratory results provided a chemical analysis of the composition of solids found on the mechanical room's surfaces (attached). The ratio of calcium to chloride found in 3 wall residue samples is consistent with a calcium chloride solution source. The 2 ceiling samples indicated elevated levels of calcium.

### Conclusions

Laboratory analysis indicate the residue samples from the walls likely contained calcium chloride. Calcium chloride is a chemical compound that is not typically found in the wall materials (i.e., paint). Calcium chloride was used in the Fernie Memorial Arena's secondary coolant (brine) system. It is likely the residue on the mechanical room wall surfaces was the brine solution.



**Figure I-1:** Map of residue samples collected by Technical Safety BC



**Metro Tech Systems Ltd.**  
*Petroleum Product Consultants*

Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (1) Ceiling Above Liquid Receiver  
Sample ID: Dried Residue on Outer layer of Gyprock Ceiling  
Sample #: YB2784  
Date: February 1, 2018

**As Figure 1 shows the residue on Outer Layer of Gyprock Ceiling is made of:**

**Oxygen: 49%**  
**Calcium: 28%**  
**Sulphur: 22%**  
**Silicon: 0.3%**  
**Magnesium: 0.2%**

**Suspect Calcium Sulphate or Calcium Sulphite or unknown compound of Calcium, Sulphur and Oxygen.**

**Please find the source of Sulphur.**

**For reference Figure 2 shows Calcium Chloride and Figure 3 shows Dry wall composition which is mostly Carbon and Oxygen.**



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (1) Ceiling Above Liquid Receiver  
Sample ID: Dried Residue on Outer layer of Gyprock Ceiling  
Sample #: YB2784  
Date: February 1, 2018

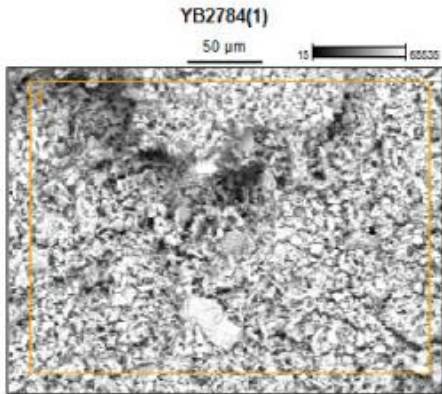
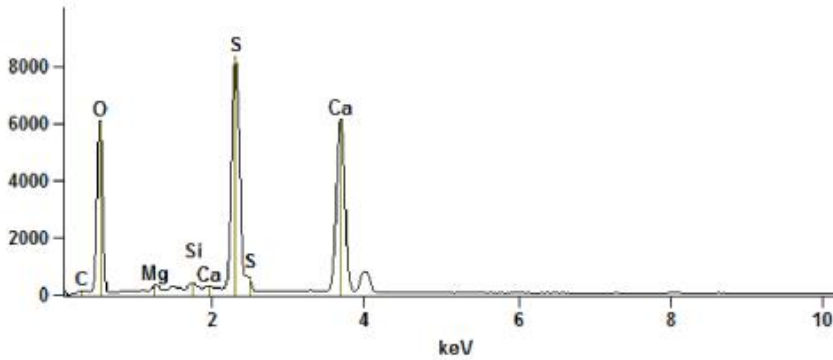


Figure 1

Full scale counts: 8351 YB2784(1)\_pt1



Weight %	O-K	Mg-K	Si-K	S-K	Ca-K
YB2784(1)_pt1	48.97	0.24	0.28	22.15	28.37



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (1) Ceiling Above Liquid Receiver  
Sample ID: Dried Residue on Outer layer of Gyprock Ceiling  
Sample #: YB2784  
Date: February 1, 2018

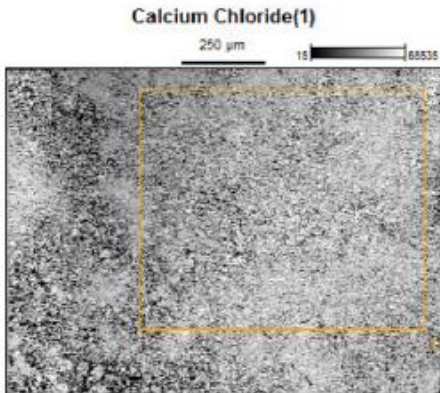
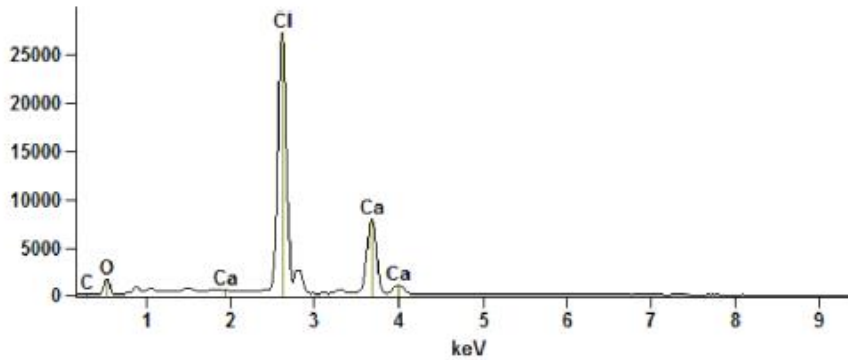


Figure 2  
Calcium Chloride

Note: Figure 2 for Location (1), Sample #: YB2784 provides an analysis of a sample taken from a bag labeled “Anhydrous Calcium Chloride 94-97% Mini-Pellets” located in the Fernie arena mechanical room.

Full scale counts: 27122

Calcium Chloride(1)\_pt1



Weight %	Cl-K	Ca-K
Calcium Chloride(1)_pt1	64.06	35.94



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (1) Ceiling Above Liquid Receiver  
Sample ID: Dried Residue on Outer layer of Gyprock Ceiling  
Sample #: YB2784  
Date: February 1, 2018

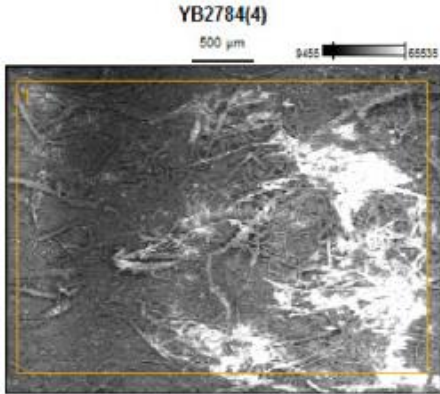
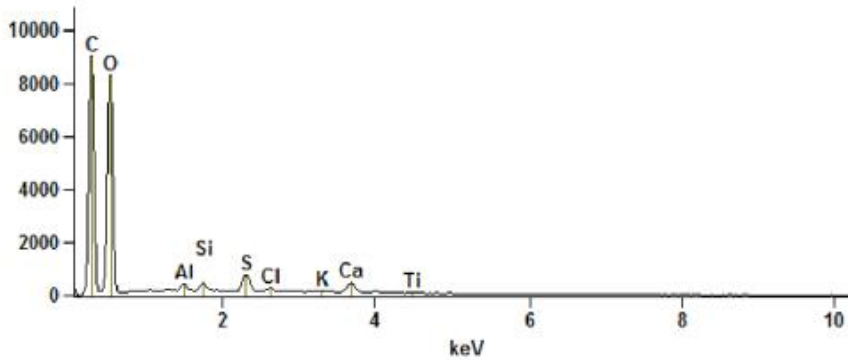


Figure 3  
Composition of  
drywall

Full scale counts: 9045 YB2784(4)\_pt1



Weight %	C-K	O-K	Al-K	Si-K	S-K	Cl-K	K-K	Ca-K	Ti-K
YB2784(4)_pt1	47.70	47.36	0.37	0.48	1.58	0.32	0.31	1.63	0.25



**Client: Technical Safety BC**

**Contact:** [REDACTED]

**Location: (2) Wall near Liquid Receiver**

**Sample ID: Dried Residue scraped off painted cement block wall**

**Sample #: YB2785**

**Date: February 2, 2018**

**Figure 1 shows composition of solids scraped off painted cement.**

**As Figure 1 and 2 show the solids are made of Iron Oxide, paint, Calcium, Calcium Chloride (suspect), Carbon (Suspect wall), trace amount of Aluminum, Manganese, Copper, Silicon and Magnesium.**





Client: Technical Safety BC  
 Contact: [REDACTED]  
 Location: (2) Wall near Liquid Receiver  
 Sample ID: Dried Residue scraped off painted cement block wall  
 Sample #: YB2785  
 Date: February 2, 2018

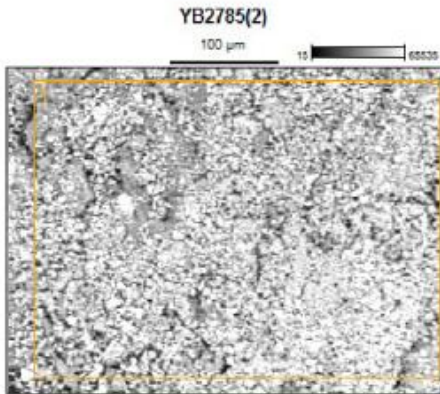
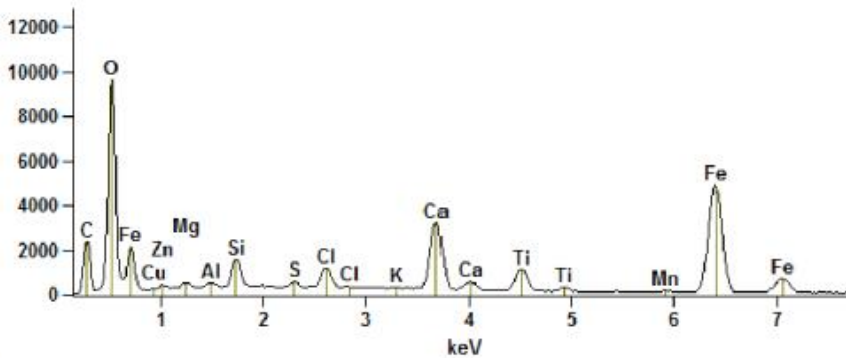


Figure 1

Full scale counts: 9637 YB2785(2)\_pt1



Weight %	C-K	O-K	Mg-K	Al-K	Si-K	S-K	Cl-K	K-K	Ca-K	Ti-K	Mn-K	Fe-K	Cu-K	Zn-K
YB2785(2)_pt1	15.4	30.1	0.57	0.42	1.96	0.47	1.75	0.08	7.91	3.92	0.32	35.1	0.72	1.16
	1	2										8		



Client: Technical Safety BC  
 Contact: [REDACTED]  
 Location: (2) Wall near Liquid Receiver  
 Sample ID: Dried Residue scraped off painted cement block wall  
 Sample #: YB2785  
 Date: February 2, 2018

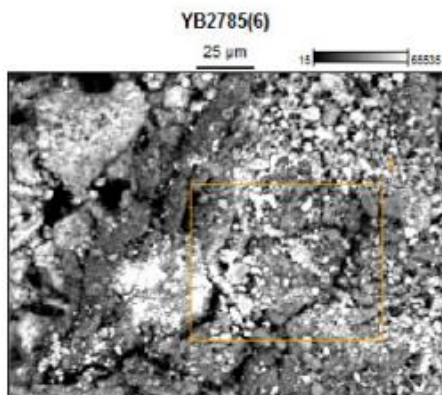
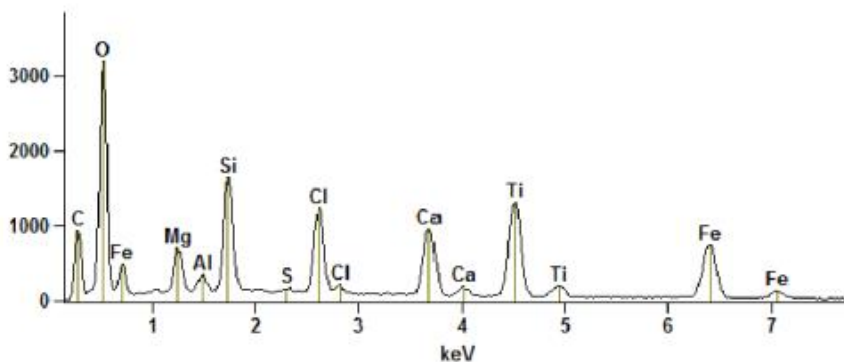


Figure 2

Full scale counts: 3192 YB2785(6)\_pt1



Weight %

	C-K	O-K	Na-K	Mg-K	Al-K	Si-K	S-K	Cl-K	Co-K	Ti-K	Fe-K
YB2785(6)_pt1	19.48	33.69	0.13	2.38	0.81	5.54	0.33	5.19	5.88	13.17	13.40



**Client: Technical Safety BC**

**Contact:** [REDACTED]

**Location: (3) Lower Center of Back Wall under shelf**

**Sample ID: Dried Residue scraped off painted cement block wall**

**Sample #: YB2786**

**Date: February 2, 2018**

**Figure 1 shows composition of solids scraped off painted cement.**

**As Figure 1 show the solids are made of Iron Oxide, paint, Calcium, Calcium Chloride (suspect), Carbon (Suspect wall), trace amount of Aluminum, Silicon and Magnesium.**



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (3) Lower Center of Back Wall under shelf  
Sample ID: Dried Residue scraped off painted cement block wall  
Sample #: YB2786  
Date: February 2, 2018

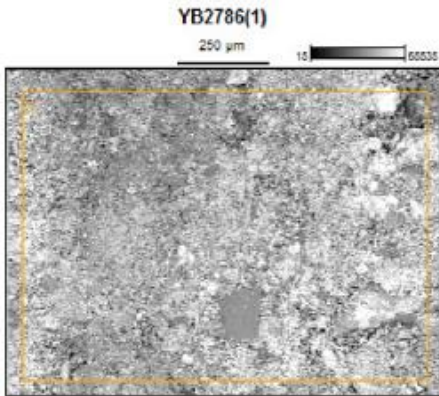
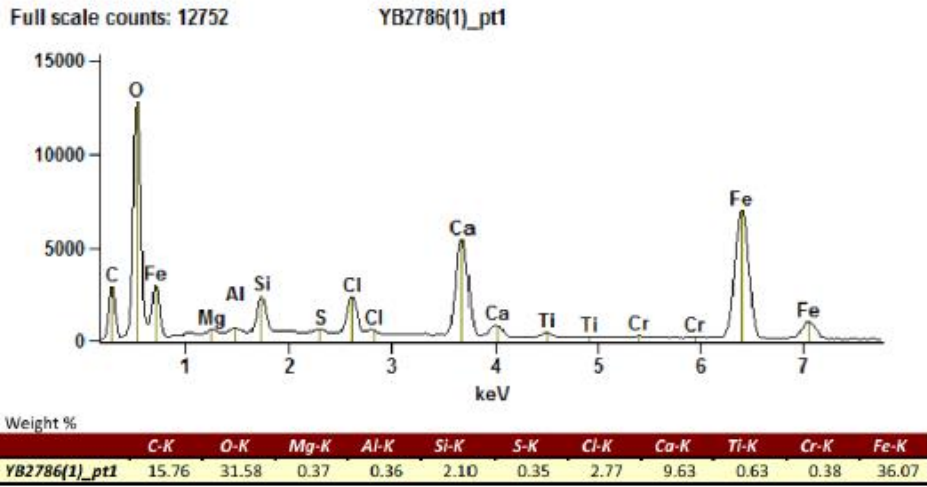


Figure 1





**Client:** Technical Safety BC

**Contact:** [REDACTED]

**Location:** (4) Back Wall near Vestibule door

**Sample ID:** Dried Residue scraped off painted cement block wall

**Sample #:** YB2787

**Date:** February 2, 2018

**Figure 1 shows composition of solids scraped off painted cement.**

**As Figure 1 show the solids are made of Iron Oxide, paint, Sands, Carbon (Suspect wall), trace amount of Calcium, Calcium Chloride (suspect), Aluminum, Magnesium.**



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (4) Back Wall near Vestibule door  
Sample ID: Dried Residue scraped off painted cement block wall  
Sample #: YB2787  
Date: February 2, 2018

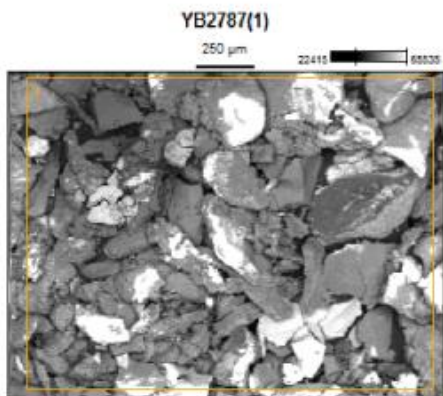
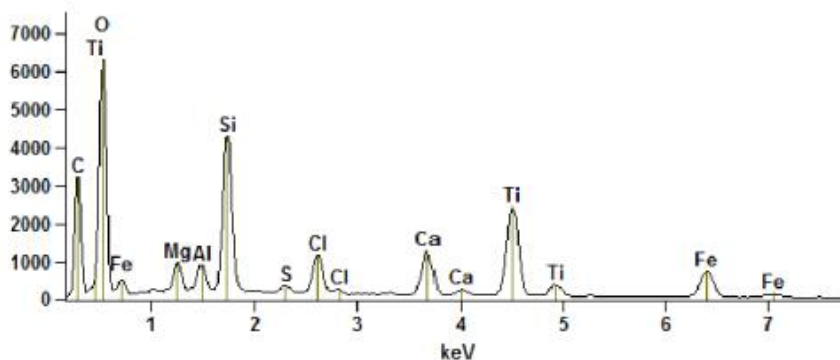


Figure 1

Full scale counts: 6298 YB2787(1)\_pt1



Weight %	C-K	O-K	Mg-K	Al-K	Si-K	S-K	Cl-K	Ca-K	Ti-K	Fe-K
YB2787(1)_pt1	27.40	35.87	1.37	1.19	7.66	0.47	2.58	3.68	12.93	6.86



**Client: Technical Safety BC**

**Contact:** [REDACTED]

**Location: (5) Ceiling above vestibule door**

**Sample ID: Dried residue on 2 sq cm outer Layer of Gyprock ceiling**

**Sample #: YB2788**

**Date: February 2, 2018**

**As Figure 1 shows the residue on Outer Layer of Gyprock Ceiling is made of:**

**Oxygen: 49%**

**Calcium: 27%**

**Sulphur: 22%**

**Silicon: 0.5%**

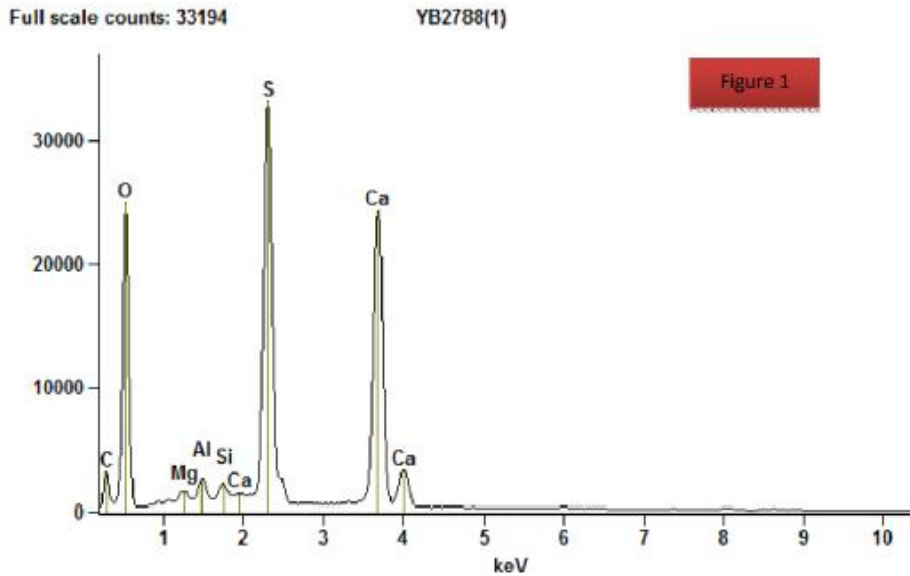
**Magnesium: 0.4%**

**Aluminum: 0.8%**

**Suspect Calcium Sulphate or Calcium Sulphite or unknown compound of Calcium, Sulphur/Oxygen.**



Client: Technical Safety BC  
Contact: [REDACTED]  
Location: (5) Ceiling above vestibule door  
Sample ID: Dried residue on 2 sq cm outer Layer of Gyprock ceiling  
Sample #: YB2788  
Date: February 2, 2018



Quantitative Results for: YB2788(1)

Element Line	Net Counts	Weight %	Atom %
O K	181638	49.14	68.26
Mg K	6298	0.43	0.40
Al K	13418	0.83	0.68
Si K	8993	0.49	0.39
S K	394096	21.94	15.21
Ca K	324834	27.16	15.06
Total		100.00	100.00