



Certificate of Analysis

Client: Contact:	Lab No:	2106555	FSASWPv1
	Date Received:	10-Jan-2019	
	Date Reported:	16-Jan-2019	
	Quote No:	91644	
	Order No:	5500024675	
	Client Reference:	Batch # M184/18 Q4 Comp	
	Add. Client Ref:	Date of Manufacture: 09/01/19	
	Submitted By:		

Sample Type: Fluorosilicic Acid

Sample Name:		HFA Batch # M184/18 Q4 Comp 09-Jan-2019		Specifications	Outside Limit
Lab Number:		2106555.1			
Fluorosilicic Acid					
Apparent Hazen Colour	Hazen units	30		maximum of 200	No
Turbidity	NTU	4.1		< 20 NTU.	No
Fluorosilicic acid (H ₂ SiF ₆)	%	22.0		21.0 - 23.0%	No
Free Acidity (as HF)	%	0.23		< 1.0% w/w	No
Total Suspended Solids	g/m ³	< 60		< 1,000 g/m ³	No
Specific Gravity	20°C/20°C	1.20		1.20 - 1.23	No
Aluminium	mg/kg as rcvd	10.7		-	-
Antimony	mg/kg as rcvd	< 0.09		-	-
Arsenic	mg/kg as rcvd	0.6		-	-
Barium	mg/kg as rcvd	0.36		-	-
Beryllium	mg/kg as rcvd	< 0.05		-	-
Boron	mg/kg as rcvd	< 3		-	-
Cadmium	mg/kg as rcvd	0.04		-	-
Chromium	mg/kg as rcvd	< 0.3		-	-
Copper	mg/kg as rcvd	< 0.3		-	-
Iodine	mg/kg as rcvd	5.2		< 50 mg/kg	No
Iron	mg/kg as rcvd	16		-	-
Lead	mg/kg as rcvd	< 0.05		-	-
Manganese	mg/kg as rcvd	1.1		-	-
Mercury	mg/kg as rcvd	< 0.05		-	-
Molybdenum	mg/kg as rcvd	< 0.09		-	-
Nickel	mg/kg as rcvd	< 0.3		-	-
Phosphorus	mg/kg as rcvd	200		< 1,000 mg/kg	No
Selenium	mg/kg as rcvd	< 0.5		-	-
Silver	mg/kg as rcvd	< 0.05		-	-
Thallium	mg/kg as rcvd	< 0.03		-	-
Tin	mg/kg as rcvd	< 0.3		-	-
Uranium	mg/kg as rcvd	0.069		-	-
Zinc	mg/kg as rcvd	< 0.5		-	-

The Specification limits were supplied by the customer.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Fluorosilicic Acid			
Test	Method Description	Default Detection Limit	Sample No

Sample Type: Fluorosilicic Acid			
Test	Method Description	Default Detection Limit	Sample No
TMAH Digestion	Tetramethylammonium hydroxide micro digestion, filtration. P.A.Fecher, I.Goldman and A.Nagengast. Journal of Analytical Atomic Spectrometry, 1998, 13, 977-982.	-	1
Sample dilution for ICP-MS analysis	Dilution of sample in preparation for ICP-MS analysis.	-	1
Apparent Hazen Colour	Determined on original sample without filtration or centrifugation, determination by Lovibond colorimeter. APHA 2120 B (modified) 23 rd ed. 2017.	5 Hazen units	1
Turbidity	Analysis using a Hach 2100N, Turbidity meter. APHA 2130 B 23 rd ed. 2017.	0.05 NTU	1
Fluorosilicic acid (H ₂ SiF ₆)	Titration of ionizable hydrogen in a chilled solution from which the fluorosilicate ions have been precipitated as potassium fluorosilicate. ANSI / AWWA B703-11.	0.10 %	1
Free Acidity (as HF)	Titration of hot solution from Fluorosilicic acid titration with standard sodium hydroxide to the neutral point of bromothymol blue. ANSI / AWWA B703-11.	0.10 %	1
Total Suspended Solids	Filtration using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23 rd ed. 2017.	3 g/m ³	1
Specific Gravity	Calculation: weight of sample / weight of equivalent volume of water at ambient temperature (approx. 20°C), gravimetry (measuring cylinder).	0.01 20°C/20°C	1
Aluminium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.05 mg/kg as rcvd	1
Antimony	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.004 g/m ³	1
Antimony	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.004 mg/kg as rcvd	1
Arsenic	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.02 g/m ³	1
Arsenic	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.016 mg/kg as rcvd	1
Barium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.11 g/m ³	1
Barium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0016 mg/kg as rcvd	1
Beryllium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.002 g/m ³	1
Beryllium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0016 mg/kg as rcvd	1
Boron	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.10 g/m ³	1
Boron	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.08 mg/kg as rcvd	1
Cadmium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0010 g/m ³	1
Cadmium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0008 mg/kg as rcvd	1
Chromium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.010 g/m ³	1
Chromium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.008 mg/kg as rcvd	1
Copper	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.010 g/m ³	1
Copper	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.008 mg/kg as rcvd	1
Total Iodine	Sample digestion with aqueous TMAH at 90°C. Analysis by ICP-MS. APHA 3125 B 23 rd ed. 2017.	0.0010 g/m ³	1
Iodine	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0008 mg/kg as rcvd	1
Iron	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.4 g/m ³	1
Iron	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.4 mg/kg as rcvd	1
Lead	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.002 g/m ³	1
Lead	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0016 mg/kg as rcvd	1
Manganese	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.010 g/m ³	1

Sample Type: Fluorosilicic Acid			
Test	Method Description	Default Detection Limit	Sample No
Manganese	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.008 mg/kg as rcvd	1
Mercury	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.002 g/m ³	1
Mercury	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0016 mg/kg as rcvd	1
Molybdenum	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.004 g/m ³	1
Molybdenum	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.004 mg/kg as rcvd	1
Nickel	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.010 g/m ³	1
Nickel	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.008 mg/kg as rcvd	1
Phosphorus	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.4 g/m ³	1
Phosphorus	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.4 mg/kg as rcvd	1
Selenium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.02 g/m ³	1
Selenium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.016 mg/kg as rcvd	1
Silver	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.002 g/m ³	1
Silver	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0016 mg/kg as rcvd	1
Thallium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0010 g/m ³	1
Thallium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0008 mg/kg as rcvd	1
Tin	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.010 g/m ³	1
Tin	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.008 mg/kg as rcvd	1
Uranium	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0004 g/m ³	1
Uranium	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.0004 mg/kg as rcvd	1
Zinc	Analysed as received (after acid preservation, if required), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.02 g/m ³	1
Zinc	Analysed as received (following dilution), ICP-MS, screen level. APHA 3125 B 23 rd ed. 2017.	0.016 mg/kg as rcvd	1

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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