

CONSTRUCTION
TECHNOLOGY LABORATORIES

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Client: Project: KTHMET SA

**Chemical Analysis** 

CTL Project No.: CTL Proj. Mgr.: 380960 Terry Jore

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Approved: Date Analyzed:

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Date Received: February 6, 2007

Date Reported:

February 23, 2007 February 28, 2007

## REPORT OF CHEMICAL ANALYSIS

Client's Sample ID:

Diatomite & Clay

Material type: CTL Sample ID:

1778701

SiO <sub>2</sub> 69.49 Al <sub>2</sub> O <sub>3</sub> 13.12 Fe <sub>2</sub> O <sub>3</sub> 4.88 CaO 1.03 MgO 1.52 SO <sub>3</sub> 0.10 Na <sub>2</sub> O 0.68 K <sub>2</sub> O 1.85 TiO <sub>2</sub> 0.63 P <sub>2</sub> O <sub>5</sub> 0.15 Mn <sub>2</sub> O <sub>3</sub> 0.23 SrO 0.23 SrO 0.01 Cr <sub>2</sub> O <sub>3</sub> 0.02 ZnO 0.03 L.O.I. (950° C) <sup>2</sup> 5.59 Total 99.33 Alkalies as Na <sub>2</sub> O 1.90 Thermogravimetric Analysis - (As Received Basis) Free moisture (Ambient-105° C) 1.17 L.O.I. (105° C - 750° C) 5.16 L.O.I. (750° C - 950° C) 0.36 Calculations per ASTM C 618-03 SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	CTL Sample ID:	1//8/01
Al <sub>2</sub> O <sub>3</sub> 13.12 Fe <sub>2</sub> O <sub>3</sub> 4.88 CaO 1.03 MgO 1.52 SO <sub>3</sub> 0.10 Na <sub>2</sub> O 0.68 K <sub>2</sub> O 1.85 TiO <sub>2</sub> 0.63 P <sub>2</sub> O <sub>5</sub> 0.15 Mn <sub>2</sub> O <sub>3</sub> 0.23 SrO 0.23 SrO 0.02 ZnO 0.03 L.O.I. (950° C) <sup>2</sup> 5.59 Total 99.33 Alkalies as Na <sub>2</sub> O 1.90 Thermogravimetric Analysis - (As Received Basis) Free moisture (Ambient-105° C) 1.17 L.O.I. (105° C - 750° C) 5.16 L.O.I. (750° C - 950° C) 0.36  Calculations per ASTM C 618-03 SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Analyte	Weight %
Fe₂O₃       4.88         CaO       1.03         MgO       1.52         SO₃       0.10         Na₂O       0.68         K₂O       1.85         TiO₂       0.63         P₂O₅       0.15         Mn₂O₃       0.23         SrO       <0.01	SiO <sub>2</sub>	69.49
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Al <sub>2</sub> O <sub>3</sub>	13.12
$\begin{array}{c} \text{MgO} \\ \text{SO}_3 \\ \text{Na}_2\text{O} \\ \text{Na}_2\text{O} \\ \text{C}_2\text{O} \\ \text{TiO}_2 \\ \text{P}_2\text{O}_5 \\ \text{Mn}_2\text{O}_3 \\ \text{SrO} \\ \text{Cr}_2\text{O}_3 \\ \text{ZnO} \\ \text{L.O.I. (950° C)}^2 \\ \text{Total} \\ \\ \text{Alkalies as Na}_2\text{O} \\ \text{TiO}_2 \\ \text{O.03} \\ \text{L.O.I. (105° C - 750° C)} \\ \text{Total} \\ \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3} \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 \\ \text{SiO}_2 + \text{Al}_2\text{O}_3 + $	Fe <sub>2</sub> O <sub>3</sub>	4.88
SO3       0.10         Na2O       0.68         K₂O       1.85         TiO₂       0.63         P₂O₅       0.15         Mn₂O₃       0.23         SrO       <0.01	CaO	1.03
Na₂O       0.68         K₂O       1.85         TiO₂       0.63         P₂O₅       0.15         Mn₂O₃       0.23         SrO       <0.01	MgO	1.52
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	SO <sub>3</sub>	0.10
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Na <sub>2</sub> O	0.68
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	K <sub>2</sub> O	1.85
$\begin{array}{llllllllllllllllllllllllllllllllllll$	TiO <sub>2</sub>	0.63
SrO       <0.01	P <sub>2</sub> O <sub>5</sub>	0.15
Cr₂O₃       0.02         ZnO       0.03         L.O.I. (950° C)²       5.59         Total       99.33         Alkalies as Na₂O       1.90         Thermogravimetric Analysis - (As Received Basis)         Free moisture (Ambient-105° C)       1.17         L.O.I. (105° C - 750° C)       5.16         L.O.I. (750° C - 950° C)       0.36         Calculations per ASTM C 618-03         SiO₂+Al₂O₃+Fe₂O₃         87.5	$Mn_2O_3$	0.23
ZnO	SrO	< 0.01
L.O.I. (950° C) <sup>2</sup> Total  Alkalies as Na <sub>2</sub> O  1.90  Thermogravimetric Analysis - (As Received Basis)  Free moisture (Ambient-105° C)  L.O.I. (105° C - 750° C)  L.O.I. (750° C - 950° C)  Calculations per ASTM C 618-03  SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Cr <sub>2</sub> O <sub>3</sub>	0.02
Total 99.33  Alkalies as Na₂O 1.90  Thermogravimetric Analysis - (As Received Basis)  Free moisture (Ambient-105° C) 1.17  L.O.I. (105° C - 750° C) 5.16  L.O.I. (750° C - 950° C) 0.36  Calculations per ASTM C 618-03  SiO₂+Al₂O₃+Fe₂O₃ 87.5	ZnO	0.03
Total 99.33  Alkalies as Na₂O 1.90  Thermogravimetric Analysis - (As Received Basis)  Free moisture (Ambient-105° C) 1.17  L.O.I. (105° C - 750° C) 5.16  L.O.I. (750° C - 950° C) 0.36  Calculations per ASTM C 618-03  SiO₂+Al₂O₃+Fe₂O₃ 87.5	L.O.I. (950° C) <sup>2</sup>	5.59
Thermogravimetric Analysis - (As Received Basis)  Free moisture (Ambient-105° C) 1.17  L.O.I. (105° C - 750° C) 5.16  L.O.I. (750° C - 950° C) 0.36   Calculations per ASTM C 618-03  SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Total	99.33
Free moisture (Ambient-105° C)  1.17  L.O.I. (105° C - 750° C)  5.16  L.O.I. (750° C - 950° C)  Calculations per ASTM C 618-03  SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Alkalies as Na <sub>2</sub> O	1.90
L.O.I. (105° C - 750° C) 5.16 L.O.I. (750° C - 950° C) 0.36 Calculations per ASTM C 618-03 SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Thermogravimetric Analysis - (As Received Basis)	
L.O.I. (750° C - 950° C) 0.36  Calculations per ASTM C 618-03  SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	Free moisture (Ambient-105° C)	1.17
L.O.I. (750° C - 950° C) 0.36  Calculations per ASTM C 618-03  SiO <sub>2</sub> +Al <sub>2</sub> O <sub>3</sub> +Fe <sub>2</sub> O <sub>3</sub> 87.5	L.O.I. (105° C - 750° C)	5.16
$SiO_2 + AI_2O_3 + Fe_2O_3$ 87.5	L.O.I. (750° C - 950° C)	0.36
	Calculations per ASTM C 618-03	
L.O.I. 750° C (dry 105° C basis) 5.22	$SiO_2+AI_2O_3+Fe_2O_3$	87.5
	L.O.I. 750° C (dry 105° C basis)	5.22

Notes:

- 1. This analysis represents specifically the sample submitted.
- 2. Results reported on an oven dry (105°C) basis.
- 3. Oxide analysis by X-ray fluorescence spectrometry. Samples fused at 1000°C with Li<sub>2</sub>B<sub>4</sub>O<sub>7</sub>/LiBO<sub>2</sub>.
- 4. Elemental sulfur and sulfide sulfur may be lost during high temperature ignition and fusion.
- 5. This report may not be reproduced except in its entirety.