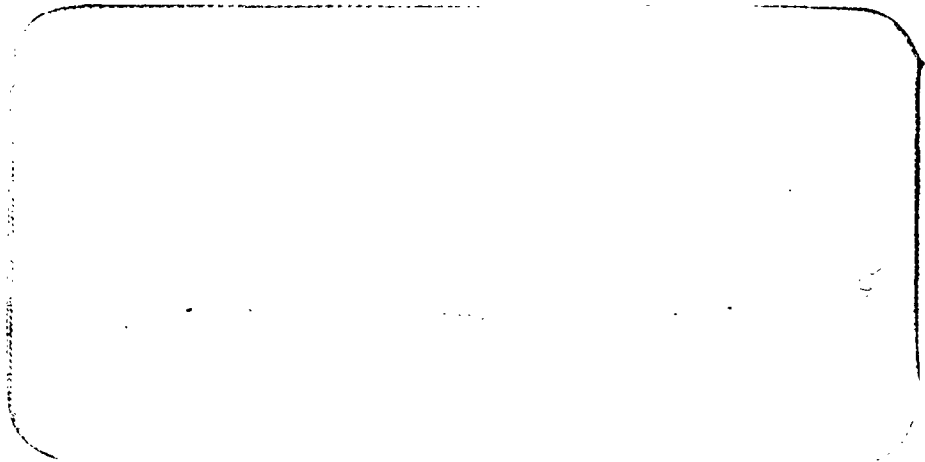




Shell Chemical Company

Apache-Blast DATA

LAM 002357

August 15, 1978

H. M. Hancock

Apache-Blast abrasive would be a suitable replacement for sand from an industrial hygiene standpoint. The TLV for the mixture is calculated on the attached page. This TLV is significantly greater than the OSHA PEL for sand. Air samples of this abrasive should be collected as early as possible. G. L. Buchanan will conduct the air sampling.

JDR:gri



J. D. RANDELL

cc: M. T. Anderson
G. L. Buchanan/
D. O. Chrismer

LAM 002358

DPMC-08513

H. M. Hedrick Company
Apache Air Blast Abrasives

APACHE-BLAST ABRASIVE
Typical Chemical Analysis

<u>TLV</u>		
5	Iron.....	41.2% (FeO = 32.0, Fe ₃ O ₄ = 9.2%)
10	Silicon.....	38.5 (no free silica)
10	Aluminum.....	9.41 (oxide)
5	Calcium.....	6.1 (oxide)
10	Magnesium.....	1.51 (oxide)
5	Zinc	1.46
5(c)	Manganese.....	0.50
1	Copper.....	0.38
10	Titanium.....	0.18
.15	Lead.....	0.015
0.5	Barium.....	0.027
2	Tin.....	0.038
-	Gallium.....	0.011
.05	Chromium.....	0.035
1	Nickel.....	0.012
10	Molybdenum.....	0.032
.05(c)	Vanadium.....	0.006
.01	Silver.....	0.0011
0.1	Cobalt.....	0.015
-	Strontium.....	0.029
	Gold.....	0.001 (not detected, less than)
	Platinum.....	0.002 (not detected, less than)
	Palladium.....	0.002 (not detected, less than)
	Rhodium.....	0.010 (not detected, less than)
	Ruthenium.....	0.010 (not detected, less than)

all other elements nil.

Note: All the elements occur as complex silicates in the slag matrix.
Some variances will occur with copper production; the above is certified
as typical and representative.

$$\begin{aligned}
 \text{TLV for mixture} &= \frac{1}{\frac{f_{Fe}}{TLV_{Fe}} + \frac{f_{Si}}{TLV_{Si}} + \frac{f_{Al}}{TLV_{Al}} + \frac{f_{Ca}}{TLV_{Ca}} + \frac{f_{Mg}}{TLV_{Mg}} + \frac{f_{Zn}}{TLV_{Zn}} + \dots} \\
 &= \frac{1}{\frac{.412}{5} + \frac{.385}{10} + \frac{.0941}{10} + \frac{.061}{5} + \frac{.0151}{10} + \frac{.0146}{5} + \dots} \\
 &= \frac{1}{.1632} \\
 &= 6 \text{ mg/m}^3
 \end{aligned}$$

LAM 002359

H. M. Hedrick Company
Apache Air Blast Abrasives

APACHE-BLAST ABRASIVE
Typical Chemical Analysis

<u>TLV</u>		
5	Iron.....	41.2% (FeO = 32.0, Fe ₃ O ₄ = 9.2%)
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5	Calcium.....	6.1 (oxide)
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 \text{TLV for mixture} &= \frac{1}{\frac{f_{Fe}}{TLV_{Fe}} + \frac{f_{Si}}{TLV_{Si}} + \frac{f_{Al}}{TLV_{Al}} + \frac{f_{Ca}}{TLV_{Ca}} + \frac{f_{Mg}}{TLV_{Mg}} + \frac{f_{Zn}}{TLV_{Zn}} + \dots} \\
 &= \frac{1}{\frac{.412}{5} + \frac{.385}{10} + \frac{.0941}{10} + \frac{.061}{5} + \frac{.0151}{10} + \frac{.0146}{5} + \dots} \\
 &= \frac{1}{.1632} \\
 &= 6 \text{ mg/m}^3
 \end{aligned}$$

LAM 002360

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Shutdown
130309 017 X+5
1991 221.4

LAM 018635

DPMC 12272.1

LAM 018636

DPMC-12273