Reference 146

EXPLOSIVES
AP-42 Section 5.6
Reference Number
2

FROM NAUM GORRELL

NO_2 NITRATION REACTORS

$= \frac{0.08 \text{ lb}}{\text{lb TNT}} \times 2000 = 160 \frac{\text{lb } NO_2}{\text{ton}}$

Direct Process

~~CONCENTRATORS~~ AOP Plant

$\frac{1.54 \text{ lb } NO_2}{\text{ton } HNO_3} \times \frac{156 \text{ ton } HNO_3}{195 \text{ ton TNT}} \approx 1 \frac{\text{lb}}{\text{ton TNT}}$

[SAR] $\frac{8.1 \text{ \# } SO_2}{\text{ton alum}} \times \frac{428 \text{ ton alum}}{195 \text{ ton TNT}} = 17.8$ or 18

NAUM → $0.4 \frac{\text{lb mist}}{\text{ton TNT}}$

Red Water Incin.

$0.35 \frac{\text{gr}}{\text{SCF}} \times \frac{4500 \text{ SCFM}}{5 \text{ GPM}}$ (35% solids) $\times \frac{0.62 \text{ GAL red}}{\text{lb TNT}}$ (5% solids) $\times \frac{2000 \text{ lb}}{\text{ton}}$ lb/ton

$\frac{(0.35)(0.62)(4500)(2000)}{7000\ (5)} =$ ~~1.0~~

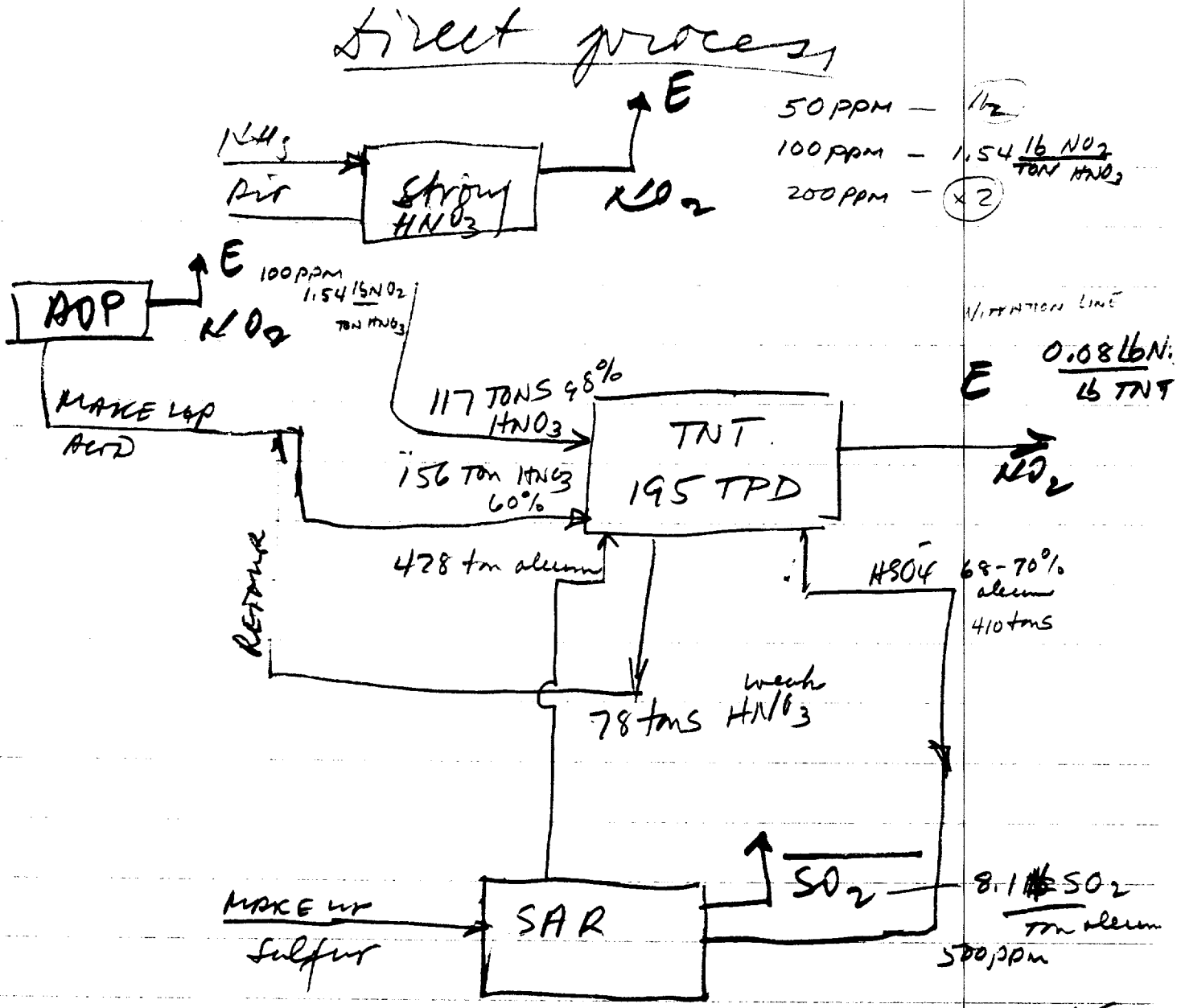
28 or ≈ ~~28~~ 30

\+ Ref. 70

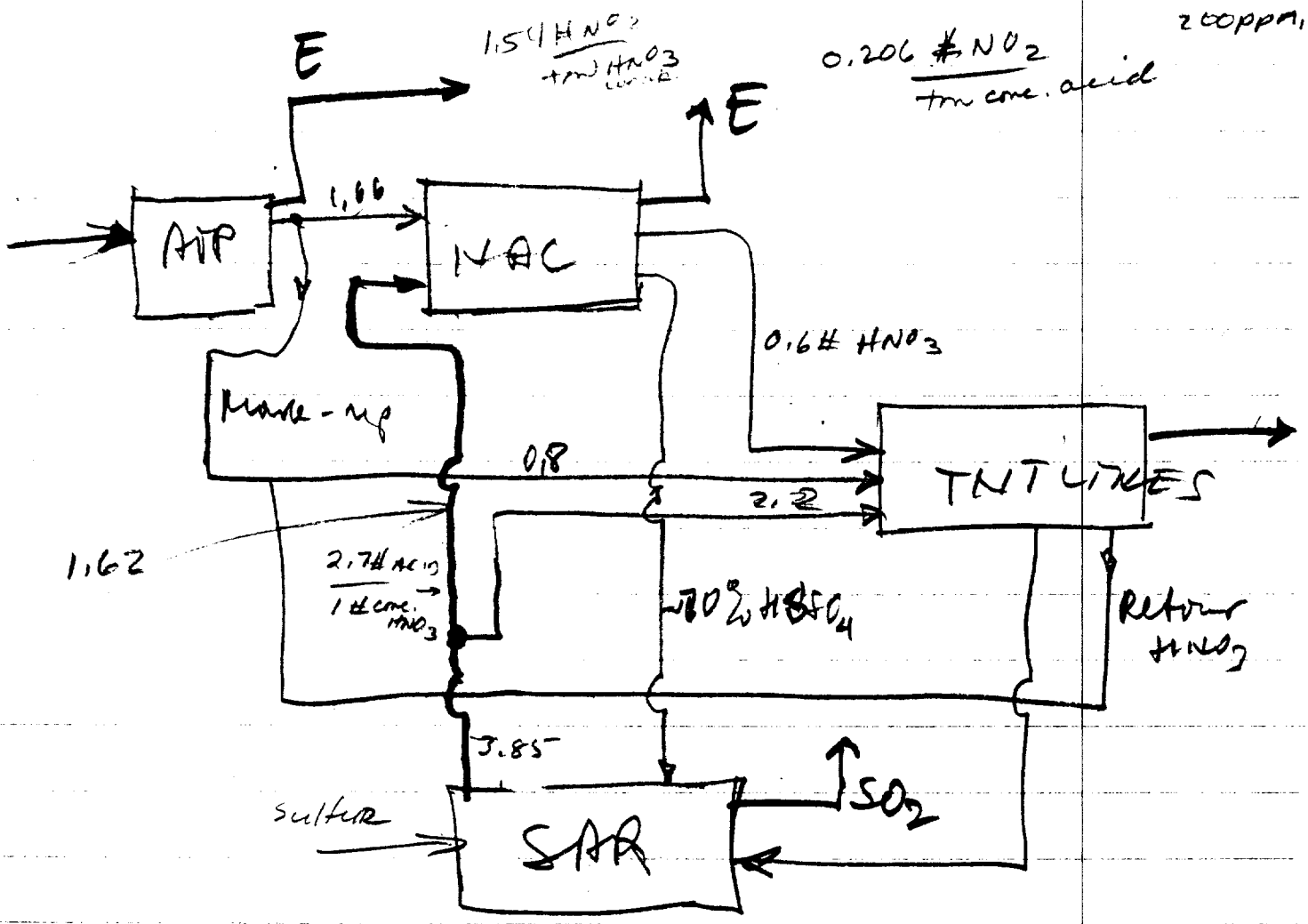
$\frac{100}{2} = 50$

36

direct process



INDIRECT PROCESS



2.46 # AOP acid / # TNT

3.85 # H_2SO_4 / # TNT

2.2 # H_2SO_4 → 1 # HNO_3 conc. acid

100 ~~ft~~ RD

0.152 lb

SAR

1 mg H_2SO_4 / SCF gas

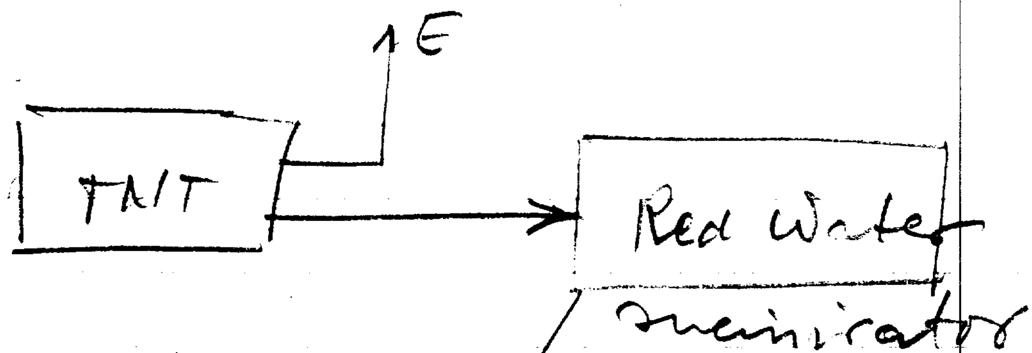
0.18 lb / ton H_2SO_4

2.2 ~~lb~~ k / TNT

0.364 lb acid mist / ton TNT

0.62 gal rad waste

~~=~~ 1 lb TNT



1360 ppm NO_2

4500 scfm / 5 gal/min

0.351 gr Part / dry scF

Red water / TNT

5.1 pounds red water / pound TNT

~~[illegible]~~ lb Part / gal red water

35-40% solids
water

5 gal 1.65 solids

$$\frac{0.35\ gR}{SCF} \times \frac{\cancel{900}\ SCF}{gal} \times \frac{lb}{7000\ gR}$$

0.045 lb / gal

[illegible] lb Pa / lb 1000

HNO_3 AOP Process 1.54 lb NO_2 / tn HNO_3

concent new 0.2# / tn NEW ≈ 2 lb NO_2 / tn HNO_3

old 20# / tn OLD PLANT ≈ 57 lb NO_2 / tn HNO_3

TNT	Part	SO_x	NO_x
NITRATION LINE	—	—	160
NITRIC ACID Mnfg.	—	—	2-58
Sulfuric Acid Regenerator	—	5	—
RED WATER INCINERATOR	450/5 to	13	6

Nitrocellu

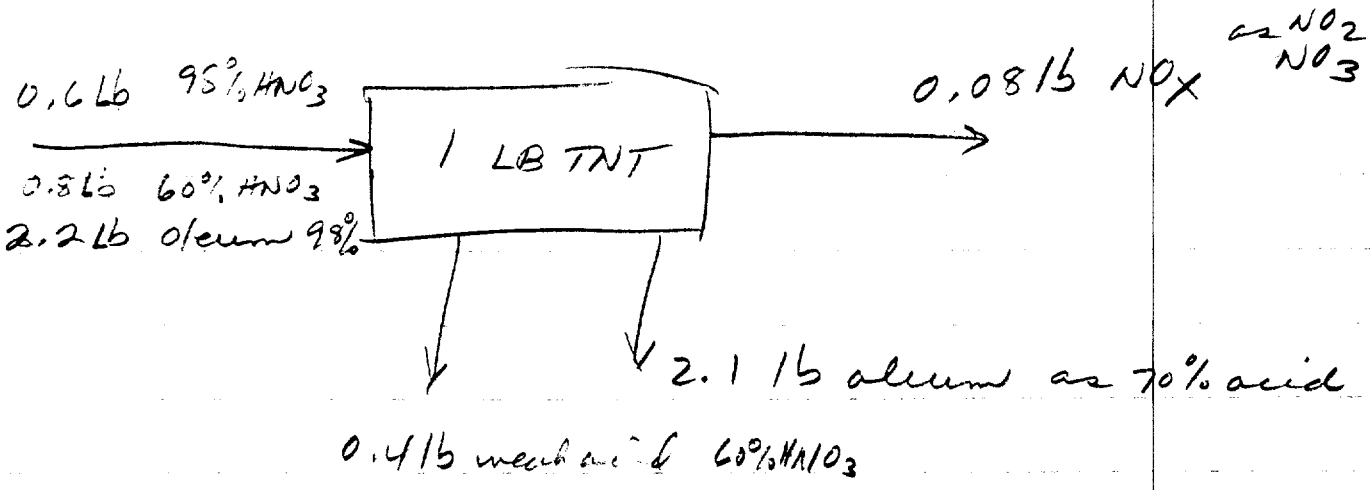
Sulfuric Acid Conc

ppm

$$0.35 \frac{gr}{SCF} \times \frac{4500 \text{ SCF}}{5 \text{ gal}} \times \frac{900}{7000 \text{ gr}} \text{ lb} \qquad 0.045 \frac{\text{lb Part}}{\text{gal}}$$

$$\frac{450}{5} = \text{Part}\ \frac{\text{lb}}{\text{gal}} \qquad 7000 \overline{)31500} \quad .04 \qquad 900 \times 35 = 31500$$

$$0.045 \frac{\text{lb Part}}{\text{gal}} \times \frac{\text{gal}}{\text{lb}} \times 5.1 \frac{\text{lb}}{\text{p. NUT}} \qquad 10{,}000 \times .045 = 450{,}000 + 200{,}000$$



AOP Ammonia Oxid. Process (60% acid

Direct Process For Mnfg, Strong HNO_3

50 ppm