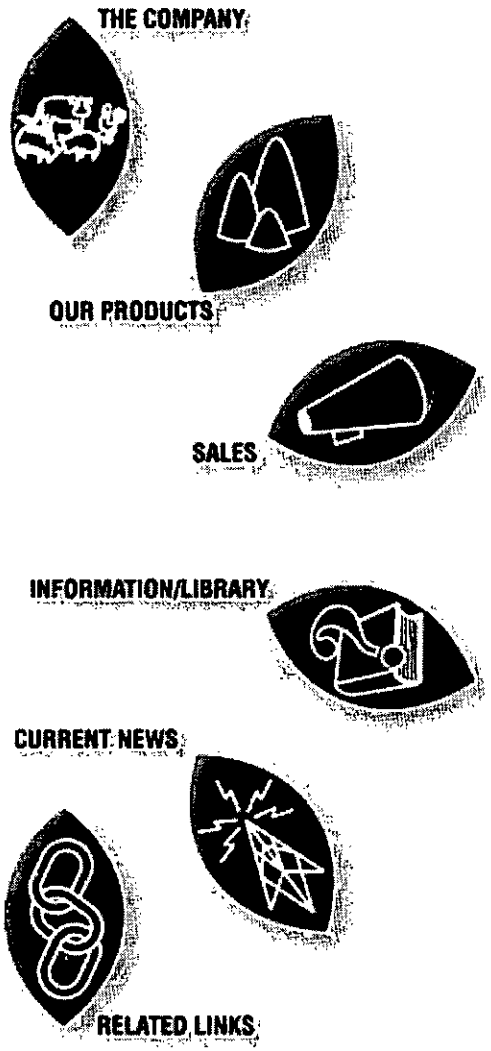

IMC AGRICO®
Feed Ingredients

Welcome to the IMC-Agrico Feed Ingredients web site. Here you'll learn more about one of the world's largest suppliers of feed-grade phosphate and potassium. For more than 50 years, the company has sold nutritional feed supplements for cattle, sheep, swine, poultry and horses.

We've just made our site easier for you to navigate, with faster links and a simplified contact/library section.
Let us know what you think.

IMC Agrico Feed Ingredients
2345 Waukegan Road, Suite E-200
Bannockburn, Illinois 60015
TEL: (847) 607-3000 • FAX: (847) 607-3527

IMC AGRICO
Feed Ingredients

OUR PRODUCTS

Product Description & Benefits	Specifications	Material Safety Data
BIOFOS® is a feed-grade monocalcium phosphate.	PDS	MSDS
DYNAFOS® is a feed-grade dicalcium phosphate.	PDS	MSDS
MULTIFOS® is a feed-grade tricalcium phosphate.	PDS	MSDS
MONOFOS® is a feed-grade monoammonium phosphate	PDS	MSDS
LIQUIFOS® is a feed-grade wet-process phosphoric acid in water.	PDS	MSDS
DYNA-K® is a feed-grade potassium chloride.	PDS	MSDS
DYNA-K® *WHITE* is a feed-grade potassium chloride.	PDS	MSDS
DYNAMATE® is a feed-grade potassium and magnesium sulfate.	PDS	MSDS
K-S® is a feed-grade potassium sulfate.	PDS	MSDS
FEED UREA 46% is a feed grade urea for ruminants.	PDS	MSDS

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Suite E-200
Bannockburn, Illinois 60015
TEL: (847) 607-3000
FAX: (847) 607-3527

PRODUCTS IMC AGRICO *Feed Ingredients*

MULTIFOS®

Tricalcium Phosphate for animal and poultry feed

PDS MSDS

Product Description:

MULTIFOS is a feed grade tricalcium phosphate. It is derived from Florida phosphate rock, in a carefully controlled thermochemical process that enhances biological availability, drives off fluorine and prepares the product for feed mixing.

Benefits:

- MULTIFOS has a high biological value.
- MULTIFOS is ideal for use in high nutrient density feeds.
- MULTIFOS means uniform analyses and product dependability.
- MULTIFOS is granular and non-hydroscopic - excellent physical qualities for ease of handling in bulk shipments and in feed mixing equipment.
- MULTIFOS provides flexibility in feed formulation. It has approximately a 1.7 to 1.9 calcium:phosphorus ratio.
- MULTIFOS feeding quality is backed up by years of IMC-Agrico and university research on tricalcium phosphates.
- MULTIFOS is continually checked by the IMC-Agrico chick test for its biological value.
- MULTIFOS is guaranteed by a continuous quality control program.
- MULTIFOS customers are kept fully informed on latest developments in phosphate nutrition.
- MULTIFOS is available by rail or truck, in bulk or in 50 lb. (22.7 kg) multi-wall, moisture-proof bags.

Specifications:

Guaranteed Analysis:	%	Physical Properties:
Phosphorus (P), min	18	Bulk density:
Calcium (Ca), max	34	lb/cu foot — 82-85
Calcium (Ca), min	30	Moisture: Approximately 0.6%
Fluorine (F), max	0.18	Color: Brownish-gray
		pH: 6.0

Typical Sieve Analysis: (Tyler)	%
Through 12 mesh, not less than	95
Through 200 mesh, not more than	5

Typical Chemical Analysis*:	%		PPM
Phosphorus	18.20	Manganese	250
Calcium	30.50	Zinc	135
Fluorine	0.15	Molybdenum	5
Iron	0.76	Copper	15
Magnesium	0.27	Cobalt	4
Sodium	4.80	Selenium	<1
Potassium	0.05		

**Analysis of trace elements are approximate only and subject to variation.*

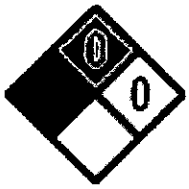
Feed Label Information:

For the purpose of registering products containing MULTIFOS, the term "phosphoric acid" has been accepted in all states as being adequately descriptive.

Material Safety Data Sheet:

EMERGENCY NUMBERS: Transportation (CHEMTREC): 800-424-9300 • Health: 800-282-9024

Identification	Fire & Explosion	Spill • Leak • Disposal
Composition	Reactivity Data	Special Protection
Physical Data	Health Hazards	Special Precaution



NFPA CODE
Blue = Health • **Red** = Fire
Yellow = Reactivity • **White** = Other

HAZARD RATING SCALE
0 = Least • **1** = Slight • **2** = Moderate
3 = High • **4** = Extreme

Identification

PRODUCT NAME — MULTIFOS®

CAS NO. — 7758-87-4

CHEMICAL FAMILY — Inorganic Salt

MOLECULAR WEIGHT — Not Applicable

CHEMICAL NAME — Not Applicable

FORMULA — $Ca_3(PO_4)_2$

DOT CLASS — Not Regulated by DOT

Composition

COMPOSITION	%	CAS NO.
Ingredients		
Tricalcium Phosphate $Ca_3(PO_4)_2$	92–93	7758-87-4
Iron, aluminum, magnesium phosphates	7-8	

MULTIFOS is not classified as a hazardous material by the criteria of the OSHA Hazard Communication Standard, 29 CFR Part 1910, .1910.1200, "Hazard Communication"

Physical Data

MELTING POINT — Not Applicable

BULK DENSITY — 85-88

VAPOR PRESSURE — Not Applicable

SPECIFIC GRAVITY (H_2O=1) — 2.6

PERCENT VOLATILE — Not Applicable

SOLUBILITY IN WATER (77° F) — Negligible

APPEARANCE AND ODOR — Brownish gray and odorless granules

Fire & Explosion

FLASH POINT — Not Applicable

FLAMMABLE LIMITS — Not Applicable

EXTINGUISHING MEDIA — MULTIFOS is a non-flammable inorganic salt. Use extinguishing media appropriate for surrounding fire.

Reactivity Data

STABILITY — MULTIFOS is stable under all normal conditions.

INCOMPATABILITY — (Materials to avoid) — None.

HAZARDOUS POLYMERIZATION — Will not occur.

Health Hazard

OSHA PERMISSIBLE EXPOSURE LIMIT OR ACGIH TLV — None established. We suggest the OSHA nuisance dust limit of 15 milligrams per cubic meter as total dust.

ROUTES OF ENTRY — Lungs (breathing), ingestion (swallowing)

EFFECTS OF OVEREXPOSURE — *Short Term:* May cause mechanical abrasion if deposited in the eyes. Inhalation of dust may cause discomfort, coughing, shortness of breath. *Long Term:* As with any inorganic dust, long-term inhalation of dust concentrations higher than recommended Permissible Exposure Limits may cause delayed lung injury.

TOXICITY DATA — None found.

FIRST AID — *Eyes* : Flush thoroughly with water. See a physician if irritation persists. *Skin:* Wash with water.

Spill, Leak & Disposal

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED — If uncontaminated, sweep up or collect, and reuse as product. If contaminated with other materials, collect in suitable containers.

WASTE DISPOSAL METHOD — Uncontaminated material can generally be disposed of in an approved land disposal facility, in accordance with applicable federal, state and local regulations. Depending upon type and extent of contamination, if any, other disposal methods may be required by environmental regulatory agencies.

Special Protection

RESPIRATORY PROTECTION — If dust concentrations exceed recommended Permissible Exposure Limits,

use NIOSH-approved dust respirators, with approval TC-21C-xxx, until feasible engineering controls are completed.

VENTILATION — Local exhaust or other ventilation that will reduce dust concentrations to less than Permissible Exposure Limits is recommended.

EYE PROTECTION — Safety glasses with side shields are recommended if flying particles may be encountered.

OTHER PROTECTIVE EQUIPMENT — Optional.

Special Precaution

None.

IMC-Agrico Feed Ingredients
2345 Waukegan Road
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Bannockburn, Illinois 60015
TEL: (847) 607-3000
FAX: (847) 607-3527
Revised September 1, 1996

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Feed Urea | Dyna-K | Dyna-K White | K-S | Liquifos
Dynamate | Monofos | Biofos | Dynafos

ANDERSEN 2000 INC

306 DIVIDEND DRIVE
PEACHTREE CITY, GEORGIA 30269 USA
PHONE (770) 486-2000
TELECOPY (770) 487-5066
www.crownandersen.com

July 15, 1998

By Fax Only: (850) 922 6979

Reference: Phosphate Defluorination Facility - Your Telephone Call On July 7, 1998
Andersen 2000 Inc File #APCE-8429-S

Mr. John Reynolds
Florida Department of Environmental Control

Dear Mr. Reynolds:

In response to your inquiry about a scrubbing system with double alkali regeneration for sulfur dioxide and hydrogen fluoride from phosphate or calcining, we searched our files and found a somewhat similar - but larger - unit which was quoted in March of this year for an application not in the state of Florida. We have made a copy of that proposal with the customer name removed and we are faxing that copy to you.

The system in the proposal was sized for an inlet gas flow rate of 63,130 acfm at 400°F and -7" W.G. This gas stream contained 1703 #/hr of sulfur dioxide and 1734 #/hr of HF. Your data would suggest a slightly larger gas flow rate with a dramatically reduced sulfur dioxide and HF content. Your data suggests a system with about 400 #/hr of sulfur dioxide and, assuming about 99.2% HF removal in a conventional scrubbing system, perhaps 400 #/hr of HF. The equal mass concentrations of SO_2 and HF would not be uncommon from a southeastern United States ore.

The proposal we are faxing includes a Model 5000 double alkali waste liquid regeneration system. If there were in fact 400 #/hr of SO_2 and 400 #/hr of HF in the inlet gas stream, then a Model 1000 double alkali waste liquid regeneration system would be required. The Model 1000 unit is priced at about $1,500,000 compared with the $4,680,000 for the Model 5000. Thus, for the application you have described by telephone, the scrubber price would be about the same as in the enclosed proposal, or $725,000. The soda ash supply system could range in price from a low of about $30,000 for a simple storage tank to a high of the $139,800 shown in the enclosed proposal. The regeneration system would then add $1,500,000.

Referring to Drawing P8229-1, chemical consumption and solid waste production would be 23.3% of the figures shown in Drawing P8229-1 in the enclosed proposal. Thus, the total package, including the scrubber, the soda ash system and the regeneration system would typically be priced at about $2.3 million, delivered to the job site in Florida.

We hope this information is adequate for your current purposes. If you need additional information, please don't hesitate to contact us.

Very truly yours,

ANDERSEN 2000 INC

Jack D. Brady, Chairman

JDB:be jr7.15

Encl: 8229

cc: *Andersen Sales Representative*
Mr. Steve King
Monarch Engineered Systems, Inc.
1598 Lago Vista Blvd.
Palm Harbor Fl. 34685
Telephone: (813) 781 1818
Fax: (813) 781 1618

PROPOSAL FOR
MODEL HS-150 SULFUR DIOXIDE, HYDROGEN FLUORIDE AND HYDROGEN CHLORIDE SCRUBBING SYSTEM WITH MODEL 5000 DOUBLE ALKALI WASTE LIQUID REGENERATION SYSTEM TO CONTROL PARTICULATE AND ACID GAS EMISSIONS FROM PHOSPHATE DEFLUORINATION KILN

PREPARED FOR

PREPARED BY
ANDERSEN 2000 INC.
306 DIVIDEND DRIVE
PEACHTREE CITY, GEORGIA 30269 USA
PHONE: (770) 486-2000
FAX: (770) 487-5066
(A CROWN ANDERSEN INC. COMPANY)

ANDERSEN 2000 INC

PROPOSAL #APCE-8229-S

MARCH 12, 1998

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DRAWINGS

I. INTRODUCTION

The Andersen 2000 Inc. scrubbing system for HF, HCl and SO_2 removal has been proven in numerous industrial and utility applications throughout the world. All installations of the Andersen scrubbing system exceed 95% in sulfur dioxide removal efficiency, 99% in HF removal efficiency and 99% in HCl removal efficiency. The system is capable of achieving as high as 99.5% sulfur dioxide removal efficiency and 99.9% for HF and HCl. The system performs equally well on low or high inlet acid concentrations. Even with dramatic variations in inlet acid gas concentrations to the scrubbing system, the Andersen system produces an almost constant outlet acid gas concentration. In this respect, it differs substantially from the competitive acid gas removal processes available. This characteristic of the Andersen system is due to operation in the "concentrated" absorption chemical mode. The active chemical in the scrubbing system is sodium sulfite (Na_2SO_3). The concentration of sodium sulfite in the Andersen system is maintained at a much higher level than it is in any of the other systems offered to plant operators. This, in turn, enables the system to operate at a lower recirculated liquid flow rate to the scrubbing system and also enables the system to capture far more sulfur dioxide per unit volume of scrubbing liquid. This reduces the size of recirculation tanks, recirculation pumps, and piping to the scrubbing system.

The Andersen scrubbing system also uses a non-plugging, low differential pressure spray-baffle-type scrubber. The scrubber can be furnished in either a horizontal or vertical configuration. The system is shipped pre-wired and pre-piped to the maximum extent possible and all piping and electrical equipment has been tested in the factory before the system is delivered. The system is shipped on saddle supports and can be lifted as a single unit onto a suitable concrete foundation. Utilities are then connected to complete this system. When the scrubbing system is installed, it requires only a small ground space. The differential pressure across the scrubbing system is 10" W.G. (254 mm) at maximum gas flow rate. The scrubber is operated in an induced draft configuration in this application.

If extremely poor quality water is used as makeup to the scrubbing system, special consideration must be given to possible stress cracking and corrosion, due primarily to chlorides in the absorbing solution. When substantial chloride concentrations are anticipated, the quench section of the Andersen scrubbing system is constructed of Alloy C-276 This alloy is extremely resistant to chloride stress cracking and corrosion at elevated temperatures. It has been used frequently in acidic chloride solutions exposed to alternate wet and dry gas streams. Once the gas has been quenched to saturation temperature, it is then possible to use fiberglass reinforced polyester for the remainder of the scrubbing system. For this particular application, these special materials are required.

Another unique feature of the Andersen scrubbing system is that it always operates in an acidic scrubbing mode. When sodium hydroxide is added to the system as the makeup reagent, it converts sodium bisulfite back to sodium sulfite, rather than existing in the scrubbing solution as free sodium hydroxide. The same is true of the soda ash feed system. The chemical reactions which occur are shown below:

$$SO_2 + Na_2SO_3 + H_2O \longrightarrow 2NaHSO_3$$

$$NaOh + NaHSO_3 \longrightarrow Na_2SO_3 + H_2O$$

OR

$$Na_2CO_3 + 2NaHSO_3 \longrightarrow 2Na_2SO_3 + CO_2 \uparrow + H_2O$$

Calcium scale problems are well known in the scrubbing industry and can cause a scrubbing system to plug up within less than a week of operation. Scale problems have been encountered by other suppliers of sulfur dioxide removal systems because of operation in an alkaline scrubbing mode. Even when the competitive systems are operated in an acidic scrubbing mode, the scrubbing solutions are so poorly buffered from pH change that slight reductions in sulfur dioxide concentration at the inlet to the scrubbing systems result in dramatic changes in scrubbing solution pH. It is frequently possible for the scrubbing system to go back into an alkaline mode of operation. When this occurs, immediate scaling of the calcium compounds occurs. Furthermore, pH control systems are not noted for the highest level of reliability. When the pH controller fails to give a proper reading, it is often possible for the system to become alkaline before an operator can check the pH controller. Again, calcium scaling will occur as soon as the system transitions to an alkaline mode of operation. In the Andersen system, because of the concentrated mode of operation, the system is highly

buffered against pH change. Because the solution is so highly buffered, even if the pH controller failed, or even if substantial changes in inlet sulfur dioxide concentration occurred, the system would not run on the alkaline side. Thus, high calcium concentrations in the makeup water can be tolerated in the Andersen system where they cannot be tolerated in competitive systems.

The acid gas removal systems discussed above use either sodium hydroxide or soda ash as the makeup chemical to absorb sulfur dioxide. After reaction with sulfur dioxide, hydrogen fluoride and hydrogen chloride, both sodium hydroxide and soda ash produce sodium sulfite, sodium bisulfite, sodium fluoride and sodium chloride as direct reaction products. In addition, some of the sodium sulfite oxidizes to sodium sulfate. All of these salts are soluble in the aqueous scrubbing solutions. The initial reactions in the systems, between either sodium hydroxide or sodium carbonate and sulfur dioxide, form sodium sulfite. Sodium sulfite exists primarily in slightly alkaline scrubbing solutions. If the sodium sulfite then contacts sulfur dioxide, it will react to form sodium bisulfite. Sodium bisulfite exists in less alkaline or in acidic scrubbing solutions. In most of the scrubbing systems installed by Andersen, both sodium sulfite and sodium bisulfite exist together in the scrubbing solution with sodium fluoride and sodium chloride and the scrubbing solution is maintained at a pH of approximately 6.8. If the sodium hydroxide or sodium carbonate converts to sodium bisulfite, it can no longer absorb additional sulfur dioxide. In addition, if any of the sodium sulfite oxidizes to sodium sulfate, the sulfate becomes an "inert" chemical in the scrubbing solution and will not react with additional sulfur dioxide. Thus, the consumption of sodium hydroxide or sodium carbonate is determined by the pH at which the scrubbing system operates, the amount of oxidation of sulfite to sulfate, and the amount of sulfur dioxide, HF and HCl removed from the gas stream. These same scrubbing solutions also contain fly ash from combustion of fuel or from process solids. The resultant waste liquid from these scrubbing systems is typically a rather deep yellow in color if the particulate matter is filtered away from it. If the particulate matter is left in the liquid, the solutions are almost black in color and have some amount of free floating condensed organics on top of them.

Sodium sulfite, sodium bisulfite and sodium fluoride are chemically regenerable, using lower cost calcium salts as precipitants. Calcium sulfite, in the dihydrate and hemihydrate crystalline form, is produced as the end product from the precipitation reactions with sodium sulfite and sodium bisulfite. The bisulfite is converted back to sulfite and, if the pH is allowed to increase, some free sodium hydroxide will be created. The regenerated liquid can then be taken back to the scrubbing system and regenerated sodium salts will directly offset the need for new sodium salts. Sodium fluoride is converted into calcium fluoride and sodium hydroxide. Sodium chloride is not regenerated. The various chemical reactions which take place during scrubbing and during regeneration are discussed below.

Andersen 2000 Inc. has designed, patented and commercialized a compact chemical regeneration system for scrubber waste liquid. This system uses either pebble lime or slaked lime to regenerate the scrubbing solutions and to create a solid waste product which can be disposed of in a suitable waste disposal site at significantly lower cost than the waste liquids. This system enables recovery of a minimum 80% of the sodium salts which would have otherwise been consumed in the scrubbing systems, and a minimum of 80% of the water which would have otherwise been disposed of in the waste liquid stream. In most cases, the system will recover 85% of the sodium salts and 85% of the wastewater.

The Andersen regeneration system is unique in that it uses pebble lime directly as the reactant with the scrubbing solution. Most other chemical regeneration systems utilize slaked lime (calcium hydroxide) to insure high chemical conversion rates. The Andersen system can use slaked lime, but pebble lime is less expensive and is the favored reactant. The Andersen system utilizes extremely high agitation rates in the reactor to overcome the slower reaction rate of the calcium oxide (burned lime) when compared with slaked lime.

The various chemical reactions which occur in the sulfur dioxide absorbers are shown below. These reactions are shown for both sodium hydroxide and for soda ash used as makeup chemicals:

SO_2, HF And HCl Absorption - Sodium Hydroxide Absorbant

$2\,NaOH + SO_2 \longrightarrow Na_2SO_3 + H_2O$
Sodium Hydroxide + Sulfur Dioxide ——> Sodium Sulfite + Water

$NaOH + SO_2 \longrightarrow NaHSO_3$
Sodium Hydroxide + Sulfur Dioxide ——> Sodium Bisulfite

$Na_2SO_3 + SO_2 + H_2O \longrightarrow 2NaHSO_3$
Sodium Sulfite + Sulfur Dioxide + Water ——> Sodium Bisulfite

$NaOH + HF \longrightarrow + NaF + H_2O$
Sodium Hydroxide + Hydrogen Fluoride ——> + Sodium Fluoride + Water

$NaOH + HCl \longrightarrow + NaCl + H_2O$
Sodium Hydroxide + Hydrogen Chloride ——> + Sodium Chloride + Water

SO_2 Absorption - Soda Ash (Sodium Carbonate) Absorbant

$Na_2CO_3 + SO_2 \longrightarrow Na_2SO_3 + CO_2$
Sodium Carbonate + Sulfur Dioxide ——> Sodium Sulfite + Carbon Dioxide

$Na_2CO_3 + 2SO_2 + H_2O \longrightarrow 2NaHSO_3 + CO_2$
Sodium Carbonate + Sulfur Dioxide + Water ——> Sodium Bisulfite + Carbon Dioxide

$Na_2SO_3 + SO_2 + H_2O \longrightarrow 2NaHSO_3$
Sodium Sulfite + Sulfur Dioxide + Water ——> Sodium Bisulfite

$Na_2CO_3 + 2HF \longrightarrow 2NaF + H_2O + CO_2$
Sodium Carbonate + Hydrogen Fluoride ——> Sodium Fluoride + Water + Carbon Dioxide

$Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2$
Sodium Carbonate + Hydrogen Chloride ——> Sodium Chloride + Water + Carbon Dioxide

Oxidation

$Na_2SO_3 + 1/2\,O_2 \longrightarrow Na_2SO_4$
Sodium Sulfite + Oxygen ——> Sodium Sulfate

If the waste scrubbing liquid from these systems is then taken to the Andersen chemical regeneration system, the sulfur and fluoride compounds are precipitated from the scrubbing solution and sodium sulfite and sodium hydroxide are produced to allow additional acid gas absorption. The regeneration reactions are shown below:

Regeneration

$2NaHSO_3 + CaO \longrightarrow Na_2SO_3 + H_2O + CaSO_3$
Sodium Bisulfite + Lime ——> Sodium Sulfite + Water + Calcium Sulfite

$CaSO_3 + 2H_2O \longrightarrow CaSO_3 \cdot H_2O$ • 2
(Actually forms as $CaSO_3 \cdot 1/2H_2O$ until it cools in storage and then becomes $CaSO_3 \cdot 2H_2O$)

$2NaF + CaO + H_2O \longrightarrow CaF_2 + 2NaOH$
Sodium fluoride + Lime + Water ——> Calcium Fluoride + Sodium Hydroxide

The chemical regeneration system for the scrubber quoted in this proposal is quoted as a separate plant to serve the scrubber quoted.

ANDERSEN 2000 INC.
306 DIVIDEND DRIVE · PEACHTREE CITY, GEORGIA 30269 USA
(A CROWN ANDERSEN INC. COMPANY)

TELEPHONE:(770)486-2000
U.S.A. ONLY:(800)241-5424
TELEFAX: (770)487-5066

II. EQUIPMENT AND/OR SERVICES QUOTATION

- Proposal and Quotation No: APCE-8229-S
- For ("Buyer"):
- Quotation is: [X] Firm [ ] Preliminary [ ] Subject to the Price Escalation Policy on page _____ hereof.
- Date Submitted: MARCH 12, 1998
- Quotation Firm Until: MAY 31, 1998
- Delivery Time(s): EQUIPMENT SHIPMENT - 26 WKS AFTER ORDER RECEIPT

(NOTE: As major equipment items are completed, partial shipments may be made. Partial shipments will result in partial invoicing in the proportion that the shipment bears to the entire order.)

- F.O.B. (Place of Delivery & Special Shipping Instructions, if any):
  JOB SITE,
- Terms: 10% WITH ORDER
  30% NET 30 DAYS AFTER 50% SHOP COMPLETION
  30% NET 30 DAYS AFTER EQUIPMENT SHIPMENT
  20% NET 30 DAYS AFTER STARTUP
  10% NET 30 DAYS AFTER SUCCESSFUL OPERATION AND PERFORMANCE TESTING

All amounts which are outstanding and unpaid for more than 30 days will be subject to a late charge at the rate of one and one-half percent (1.5%) per month (or at the highest amount or rate which under applicable law Buyer may contract to pay in order to induce prompt payment, whichever is less).

- Performance Testing: [X] Required to satisfy the Performance Levels Guaranty when tested for acceptance in accordance with the Acceptance Tests specified on page(s) 22 - 24 hereof.
- Send all correspondence to Andersen 2000 Inc. at its home office address indicated above with copies to the following local Andersen 2000 Inc. sales representative(s).

THIS QUOTATION IS SUBJECT TO OUR

[X] STANDARD CONDITIONS OF SALE [SEE PAGE(S) 15 - 17 HEREOF]

[ ] TURNKEY CONTRACT TERMS AND CONDITIONS [SEE PAGE(S) _____ HEREOF]

ANDERSEN 2000 INC
306 DIVIDEND DRIVE · PEACHTREE CITY, GEORGIA 30269 USA
(A CROWN ANDERSEN INC COMPANY)

II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
		A. COMPLETE MODEL HS-150 ACID GAS SCRUBBING SYSTEM, INCLUDING THE FOLLOWING EQUIPMENT ITEMS AND SERVICES:
1	1	**ANDERSEN 2000 INC. MODEL WAF-171 WETTED APPROACH, VARIABLE THROAT QUENCH SECTION.** Constructed of 1/4" (6.4 mm) thick Alloy C-276. Quench section is shown in Drawing P8229-2 at the back of this proposal. Differential pressure across the quench section and wetted elbow can be varied from approximately 1.5" W.G. to as high as 8" W.G. using the variable throat. The quench section requires a liquid feed rate of 500 gpm (114 m^3/h) at 40 psig (2.81 kg/cm^2).
2	1	**ANDERSEN 2000 INC. MODEL HS-150 HORIZONTAL SPRAY-BAFFLE ABSORBER.** Includes an integral liquid recirculation tank and a 4-pass chevron mist eliminator. Absorber section is sized for the gas flow conditions indicated in Drawing P8229-1 and is shown in Drawing P8229-2. Scrubber recirculation tank has a total liquid capacity of 36,000 gallons (136 m^3) and an operating capacity of 2000 gallons (7.6 m^3). Entrainment separator/absorber is constructed of 1/2" (12.7 mm) thick fiberglass reinforced vinylester and is operated at a differential pressure which varies from a minimum of 1" W.G. to a maximum of 5.0" W.G. at maximum design gas flow conditions. Absorber section requires a liquid recirculation rate of 1000 gpm (227 m^3/h) at 30 psig (2.11 kg/cm^2). The chevron-type mist eliminator utilizes a constant 5 gpm (1.1 m^3/h) of fresh make-up water to maintain continuous wash on the mist eliminator. The mist eliminator is described in more detail in the brochure at the back of this proposal.
3	1	**ANDERSEN 2000 INC. SCRUBBER I.D. FAN.** Model 7-BIS-IV backward inclined blade centrifugal, Alloy C-276 wheel and rubber lined steel housing construction for an inlet gas flow rate of 51,240 acfm at -17" H_2O static pressure (13,714 psia) at an inlet gas density of 0.0562#/ft^3. Fan produces -7" W.G. at scrubber inlet and 10" W.G. for scrubber differential pressure for a total of 17" W.G. Fan is Arrangement #9, CCW, BAU, and is powered by an 1800 rpm, 200 HP, TEFC, 460V, 3 Ø, 60 Hz drive motor at 1820 rpm. Includes OSHA shaft and belt guards, bolted and gasketed access doors and Teflon® shaft seal. Fan curve is included as Figure 1. Approximate sound data can be found in Table 1. Fan includes flex connector in and out and evasee duct at discharge to stack.
4	1	**EXHAUST STACK.** Stack is 56" (1422 mm) inside diameter by 50' (15.24 m) overall height and is constructed of 3/8" (9.5 mm) thick epoxy lined steel. Stack is self-supporting from customer supplied foundation and includes the necessary supports for sampling platforms and ladders. Also includes 6 sampling ports with flanged covers.
5 (ONE SPARE)	2	**SCRUBBER RECIRCULATION PUMP.** Each pump is rubber lined cast iron construction and powered by a 200 HP, 460V, 3Ø, 60 Hz, TEFC drive motor operating at 1760 rpm. Each pump is sized to deliver 3000 gpm (681 m^3/h) at 55 psig (3.87 kg/cm^2) on 1.10 specific gravity scrubbing liquid. One pump operates and one pump is a piped spare.
6	LOT	**LADDERS, PLATFORMS, STRUCTURAL SUPPORTS, SAMPLING PLATFORM, OSHA HANDRAILS, OSHA CAGES, AND OSHA TOE PLATES FOR ALL**

ANDERSEN 2000 INC
306 DIVIDEND DRIVE · PEACHTREE CITY, GEORGIA 30269 USA
(A CROWN ANDERSEN INC COMPANY)

II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
		ACCESS PLATFORMS AND SAMPLING PLATFORMS. The access platforms, ladders, and sampling platforms are shown in Drawing P8229-2. All items are constructed of mild steel, sandblasted, primered with epoxy primer, and finish painted with epoxy paint.
7	LOT	PIPING AND PIPING SUPPORTS FOR THE SCRUBBING SYSTEM, NOT INCLUDING THE SODA ASH SYSTEM PIPING WHICH IS QUOTED SEPARATELY BELOW. Includes all necessary piping for recirculation, control, and regeneration. Piping for scrubber terminates at a single make-up water connection, a single blowdown piping connection, and a single instrument air connection. Includes all necessary valves, including control valves. Piping is FRP with non-metallic control valves for all process solution piping contact. Water piping is galvanized steel.
8	LOT	ENGINEERING DESIGN, CERTIFIED DRAWINGS, FIELD ERECTION SUPERVISION, OPERATION AND MAINTENANCE MANUALS, OPERATING AND INSTALLATION PROCEDURES, AND COMPLETE ENGINEERING DESIGN PACKAGES.
9	LOT	COMPLETE INSTRUMENTATION SYSTEM WITH MOTOR CONTROLS. Includes a NEMA 4 control panel with PLC system and all necessary control instruments for the system, an annunciator system, control power transformers, motor circuit protectors, fuses and protective devices for all of the instrumentation, and individual field mounted instruments. Includes necessary flowmeters and indicators and flow controllers for all critical process flows, a pH control system to control soda ash make-up to the scrubber, a conductivity control system to control blowdown from the scrubbing system, a differential pressure controller to control the throat position in the quench section, a complete automated pump transfer system in the event of individual pump failure, temperature and pressure indicators for all critical flows, but does not include a continuous stack monitoring system. Motor starters are housed in a NEMA 12 motor control center which must be installed inside of a weather protected building. The building is not included in the purchase price. Individual conduit and wiring connections from the starters to the individual motors are also not included.
10	LOT	FREIGHT AND INSURANCE FOR ALL EQUIPMENT ITEMS LISTED ABOVE TO JOB SITE IN
11	LOT	FIELD SUPERVISION FOR FIELD ASSEMBLY BY OTHERS OF ALL EQUIPMENT ITEMS LISTED ABOVE.
		SHIPPING WEIGHT FOR ITEMS 1 - 11 = 97,600# (44,270 Kg)
		PRICE FOR ITEMS 1 - 11 = $725,000
12	1	ANDERSEN 2000 INC. MODEL 21000 SODA ASH SLURRY STORAGE SYSTEM AS SHOWN IN DRAWINGS P8229-6 AND P8229-7. Soda ash system includes a 12' (3658 mm) diameter by 31' (9449 mm) straight sidewall slurry storage tank constructed of 1/4" (6.4 mm) thick mild steel. Tank has a total capacity of 26,000

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION

gallons (98 m^3) and an operating capacity of 20,780 gallons (78.7 m^3). Soda ash system has a total soda ash storage capacity of 136,000# (61.7 metric tons). This provides for 18 days of storage at the conditions shown in Drawing P8229-1. Tank is designed to maintain a saturated solution of soda ash at approximately 30% (wt) dissolved soda ash with up to 30% (wt) undissolved soda ash in a slurry form at the bottom of the tank. Soda ash system includes a 500 gpm, 30 psig, 1.5 sp. gr., ductile iron recirculation pump to be used during filling operations from pneumatic delivery truck or train. This pump delivers solution from the tank to a slurry mixing chamber where the dry soda ash is immediately hydrated during delivery to a slurry form for storage. Also includes a 4"Ø soda ash pneumatic fill line with the necessary controls. Soda ash system includes the required piping, the necessary electric heat tracing and insulation around the slurry draw-off points, and a complete instrumentation system as shown in the drawings. Two soda ash delivery pumps (one spare) are also provided with the system to deliver soda ash solution to the scrubber. The pumps are Ingersoll Dresser Model 2x1x10 HOC pumps powered by 5 HP, 460V, 3Ø, 60 Hz, 1800 rpm drive motors. Pumps include a tungsten face mechanical seal. The larger hydrator pump is an Ingersoll-Dresser 6x4x10 HOC, also constructed of ductile iron, and powered by a 20 HP, TEFC, 460V, 3Ø, 60 Hz drive motor. Soda ash system also includes a dust scrubber at its discharge to remove any residual dust during pneumatic filling. Also includes the necessary ladders, platforms, handrails and kickplates. These are all sandblasted and painted before shipment, and the mild steel storage tank is also sandblasted and painted before shipment. Soda ash system also includes delivery to the job site.

SODA ASH SYSTEM SHIPPING WEIGHT = 61,200# = 27,760 Kg

PRICE = $139,800

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
		B. MODEL 5000 DOUBLE ALKALI LIQUID REGENERATION SYSTEM FOR SCRUBBER DISCHARGE LIQUID.
1	3 Each	**SCRUBBER LIQUID STORAGE TANK.** Tank is 120" diameter by 142" straight sidewall with a domed cover, capable of holding 6,200 gallons each of waste liquid and operating at 6,000 gallons each under normal maximum fill conditions. Constructed entirely of high density cross-linked, rotomolded polyethylene. Tank includes a gasketed access manway at the tank top, a 2" tank vent, a 3" flanged cleanout at the base of the tank, all necessary flanged liquid nozzles for entry and exit from the tank, and all necessary instrumentation ports on the tank wall. **SHIPPING WEIGHT = 1,650# EACH = 748 Kg EACH**
2	1	**CHEMICAL REACTOR.** Draft tube type reactor, constructed of ½" thick mild steel, 10' diameter by 13' straight sidewall, and designed to operate at 6,500 gallons capacity from a pumped feed and a gravity overflow discharge. Reactor is fully covered with hinged access doors. Reactor is equipped with a 1200 rpm, turbine type agitator powered by a 30 HP, TEFC, 460V, 3Ø, 60 Hz drive motor. Shaft and turbine blades are constructed of Type 316 S.S. **SHIPPING WEIGHT = 24,000# = 10,886 Kg**
3	1	**PEBBLE LIME FEEDER.** Feeder is a Vibra-Screw volumetric live bin screw feeder capable of feeding between 30 and 300 ft^3/hr of solids. Feeder is equipped with a 7.5 HP AC drive motor, controlled by a 4-20 ma instrument signal from pH controller. Feeder is constructed of stainless steel for lime contacting parts and is connected directly with a flexible boot to an interim storage bin described below. **SHIPPING WEIGHT = 6,000# = 2,721 Kg**
4	1	**INTERIM LIME STORAGE BIN.** 6' diameter by 8' straight sidewall bin with cylindrical discharge to mount directly above the lime feeder. Sized for a minimum capacity of 230 ft^3 and constructed entirely of stainless steel. Including high level and low level switch ports, and closed cover with flanged opening to connect to the screw-lift conveyor from the bulk storage bin. **SHIPPING WEIGHT = 2,400# = 1,089 Kg**
5	1	**SCREW CONVEYOR-SCREW LIFT.** Screw elevator and conveying system with 14" diameter screw and powered by 20 HP, TEFC, 460V, 3Ø, 60 Hz gear motor unit driving screw at approximately 170 rpm. Unit is capable of conveying up to 800 ft^3/hr of pebble lime. Lift is 50' from grade level with 8' of screw conveyor to feed from the bulk storage bin to the screw lift. A bottom drive unit will be furnished. Constructed entirely of mild steel. **SHIPPING WEIGHT = 10,000# = 4,536 Kg**
6	1	**BULK LIME STORAGE BIN.** 30' diameter by 80' tall storage silo constructed of mild steel and fully welded construction. Bin is designed for a capacity of 56,500 ft^3,

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
		which is equal to approximately 2,830,000# (1284 metric tons) of pebble lime. Bin is equipped with a conical bottom connected to a Vibra-Screw, 10' diameter vibrating bin activator. The bin activator is powered by a 10 HP, TEFC, 460V, 3Ø, 60 Hz drive motor. The lime storage bin is also equipped with a pneumatic fill line, a bin vent filter with bags totaling 240 ft^2 and capable of operating at 900 acfm of exhaust gas flow during filling operations. Bag cleaning is accomplished using 20 scfm of 100 psig air. Bag cleaning is an automatic operation. Bag material is glazed polypropylene. **SHIPPING WEIGHT = 210,000# = 95,254 Kg**
7	2 (ONE SPARE)	**REACTOR FEED PUMP.** Centrifugal pump constructed of rubber lined cast iron and powered by 60 HP, TEFC, 460V, 3Ø, 60 Hz drive motor operating at 1800 rpm and direct coupled to the pump. Each pump is designed for 1500 gpm at 30 psig on up to 1.14 specific gravity scrubbing liquid. Pump is equipped with a double mechanical seal and with a seal flush water connection. Pump is base mounted with coupling, guard, and inlet and outlet expansion joints. **SHIPPING WEIGHT = 3,800# FOR 2 = 1,724 Kg FOR 2**
8	2	**SLUDGE THICKENERS.** Lamella gravity settlers with total 5,000 ft^2 of settling area and designed to accept an inlet liquid flow rate of 1,300 gpm. Each thickener is constructed of mild steel with fiberglass reinforced polyester plates, PVC internals, and flanged inlets and outlets. **SHIPPING WEIGHT = 40,000# TOTAL = 18,144 Kg**
9	2 (ONE SPARE)	**SLURRY PUMPS.** Warren Rupp Sandpiper pump or equal. Each pump is an air operated diaphragm type pump capable of handling solids up to 1" in diameter and designed to pump 100 gpm of 20% (wt) slurry at a specific gravity of 1.30 at 30 psig. Pump is constructed of cast iron with Teflon diaphragm and valves. Pump requires approximately 30 scfm air at 45 psig. **SHIPPING WEIGHT = 1,800# TOTAL = 816 Kg**
10	2	**ROTARY VACUUM FILTERS.** Ametek, Komline-Sanderson, Eimco, or equal, scraper type rotary vacuum filter. Each filter drum is 8' diameter by 8' long and has 200 ft^2 of filtration surface. Drum and tank are constructed of mild steel with polypropylene filtration decks. Drum drive is 3/4 HP Varidrive and agitator drive is 3/4 HP gear drive. Each filter is sized to process slurry feed at up to 80 gpm and to increase the solids content of the slurry from approximately 16% to approximately 51%. **SHIPPING WEIGHT = 13,500# EACH = 6,123 Kg EACH**

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
11	2	**FILTER VACUUM PUMP.** Nash, Sihi, or equal, vacuum pump capable of handling 800 scfm at 22" mercury vacuum. Powered by 60 HP, TEFC, 460V, 3Ø, 60 Hz drive motor. Pump is constructed of cast iron. Pump requires 10 gpm of recirculated seal water. **SHIPPING WEIGHT = 580# EACH = 263 Kg EACH**
12	2	**VACUUM RECEIVER.** Mild steel tank with ASME heads, 30" diameter by 60" tall, with two 4" vacuum ports to connect to rotary vacuum filter and one 4" vacuum connection to connect to vacuum pump. Including support legs and the necessary pressure regulation valves. **SHIPPING WEIGHT = 850# EACH = 385 Kg EACH**
13	2	**FILTRATE PUMP.** Self-priming centrifugal pump. Powered by 5 HP, TEFC, 460V, 3Ø, 60 Hz, 1800 rpm drive motor. Pump is designed for a liquid flow rate of 80 gpm at 20 psig discharge head. Pump is equipped with a double mechanical seal. Pump is constructed of cast iron. **SHIPPING WEIGHT = 600# EACH = 272 Kg EACH**
14	2	**FILTRATE HOLDING TANKS.** Each tank is constructed of high density cross-linked polyethylene and is 120" diameter by 142" straight side. Each tank has a capacity of 6,200 gallons and a normal operating capacity of 6,000 gallons. Tank is equipped with a closed top, an access door, and the necessary liquid entrance and exit ports and cleanouts. **SHIPPING WEIGHT = 1,650# EACH = 748 Kg EACH**
15 (ONE SPARE)	2	**FILTRATE RETURN PUMPS.** Centrifugal pump, constructed of cast iron and powered by a 75 HP, TEFC, 460V, 3Ø, 60 Hz drive motor operating at 1800 rpm and directly coupled to the pump. Pump is designed for a liquid flow rate of 1500 gpm at 45 psig on 1.10 specific gravity liquid. Pump is equipped with a double mechanical seal with seal flush water connection. **SHIPPING WEIGHT = 1,100# EACH = 499 Kg EACH**
16	3 EACH	**POLISHING FILTERS.** Bag-type filters with top inlet and bottom outlet and containing one polypropylene filter bag sized for 10 micron capture. Each filter is designed for 1000 gpm of liquid flow rate at an inlet pressure of 15 psig under clean conditions and an inlet pressure of 40 psig under dirty conditions. Filter housing is constructed of mild steel and is built to ASME code specifications. **SHIPPING WEIGHT = 1,400# EACH = 635 Kg EACH**
17 (ONE SPARE)	2	**SEAL FLUSH WATER PACKAGE.** This system consists of a small water storage tank tank, a liquid level makeup control system using plant water, a seal water recirculation pump powered by a 5 HP, TEFC, 460V, 3Ø, 60 Hz drive motor, and capable of circulating up to 100 gpm of seal water to the vacuum pump, the

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
		centrifugal pumps, and any other water seal location in the plant. Mild steel construction.
		SHIPPING WEIGHT = 1,800# EACH = 816 Kg EACH
18	2	**INGERSOLL-DRESSER, OR EQUAL, AIR COMPRESSOR.** Each compressor has a 25 HP, TEFC, 460V, 3Ø, 60 Hz drive motor operating through belt drive. Unit also includes a 250 gallon ASME National Board tank with pressure switches, reliefs, and all safety features. Each pump is capable of delivering up to 100 scfm at 150 psig.
		SHIPPING WEIGHT = 3,000# TOTAL = 1,360 Kg TOTAL
19	3 EACH	**SCRUBBER LIQUOR TANK.** Tank is 120" diameter by 142" tall with a domed cover, capable of holding 6,200 gallons of waste liquid and operating at 6,000 gallons each under normal maximum fill conditions. Constructed entirely of high density, cross-linked polyethylene for corrosion resistance. Tank includes gasketed access manway at the tank top, a 2" tank vent, a 3" flanged cleanout at the base of the tank, all necessary flanged liquid nozzles for entry and exit from the tank, and all necessary instrumentation ports on the tank wall.
		SHIPPING WEIGHT = 1,650# EACH = 748 Kg EACH
20	2 (ONE SPARE)	**RETURN LIQUOR PUMPS.** Centrifugal pump constructed of cast iron and powered by a 60 HP, TEFC, 460V, 3Ø, 60 Hz drive motor operating at 1800 rpm. Pump is designed for a liquid flow rate of 1500 gpm at 30 psig head on 1.06 specific gravity liquid. Pump is equipped with a double mechanical seal with seal flush water connection.
		SHIPPING WEIGHT = 2,000# TOTAL = 907 Kg TOTAL
21	LOT	**COMPLETE INSTRUMENTATION SYSTEM.** Includes all instruments and GE 9030 PLC controller. Including video monitors and PC data processing systems with automatic sequenced startup and shutdown system.
		SHIPPING WEIGHT = 6,000# = 2,722 Kg
22	LOT	**IEC MOTOR STARTERS.** Including NEMA 4 protected motor starters with circuit breaker protection mounted in control panel. Including motor starters for all 3Ø motors in system.
		SHIPPING WEIGHT = 6,100# = 2,767 Kg
23	LOT	**SKID MOUNTING, PRE-WIRING, PRE-PIPING AND PRE-TESTING SYSTEM TO MAXIMUM POSSIBLE DEGREE IN FACTORY.**

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II. EQUIPMENT AND/OR SERVICES QUOTATION - Continued

ITEM NO.	QUANTITY	DESCRIPTION
24	LOT	**ELECTRICAL WIRING OF ENTIRE SCRUBBING SYSTEM.** Includes conduit, wire, conduit fittings, labor, and testing of all electrical connections from the control system and instrumentation systems to the various motors and instruments in the plant.
		SHIPPING WEIGHT OF MATERIALS = 4,000# = 1,814 Kg
25	LOT	**SKIDS AND STRUCTURAL SUPPORTS.** Mild steel with primer and epoxy finish coat for all vessels and equipment. Includes OSHA ladders and platforms as required. See Drawings P8229-3 through - 5.
		SHIPPING WEIGHT = 31,000# = 14,061 Kg
26	LOT	**DESIGN ENGINEERING FOR ENTIRE SYSTEM.**
27	LOT	**SURFACE PREPARATION AND PAINTING OF ALL EQUIPMENT IN THE PLANT.**
28	LOT	**FREIGHT AND INSURANCE TO FOR ITEMS 1 - 27 ABOVE.**
		TOTAL REGENERATION SYSTEM PRICE = $4,680,000

TOTAL FOR SCRUBBERS, SODA ASH SYSTEM AND REGENERATION SYSTEM = $5,544,800

TABLE 1 - I.D. FAN SOUND DATA FOR HS-150 SCRUBBER

MODEL	: 7-BIS-IV	INLET ACFM	: 51240.
NUMBER OF BLADES	: 12	RPM	: 1820.
BLADE TYPE	: BACKWARD CURVED	SP (INCHES H20)	: 17.0
WHEEL DIA (IN)	: 44.500	HOUSING THICKNESS	: 0.3750
CAPACITY	: 0.9915	HOUSING MATERIAL	: RUBBER LINED STEEL

OCTAVE BAND LEVELS

BAND NUMBER	1	2	3	4	5	6	7	8	DBA
MID FREQUENCY-HZ	63	125	250	500	1000	2000	4000	8000	

Estimated sound power level generated at acoustic center of fan. This is noise which can be expected from inlet and discharge openings within 100 feet of fan.

107.	107.	106.	107.	103.	98.	90.	82.	108.

Estimated sound pressure level in near field after attenuation by 0.3750 inch thick housing.
with sound attenuating enclosure

87.	81.	76.	75.	66.	59.	45.	34.	75.

Estimated sound pressure level at 3 feet from near field in air.
(Ducted inlet and outlet.)

81.	75.	70.	69.	60.	53.	39.	28.	69.

Estimated sound pressure level at 5 feet from near field in air.
(Ducted inlet and outlet.)

77.	71.	66.	65.	56.	49.	35.	23.	64.

Near field radius is approximately 3 feet and is centered on fan wheel center.

The near field is a hemispherical area around the fan where sound waves from various sources tend to interfere with each other. The boundary is related to the wavelength of the lowest frequency and to the overall size of the source.

NOTE: ALL SOUND POWER LEVELS ARE DECIBELS REFERRED TO 10-12 WATT.
ALL SOUND PRESSURE LEVELS ARE DECIBELS REFERRED TO 2x10-4 MICROBAR.

IMPORTANT - INTERPRETATION OF SOUND DATA

Data are for use by an acoustical engineer to evaluate the fan and the system in which the fan is installed. There are many varibles which can affect sound pressure levels. The acoustical engineer must take all of these variables into consideration when designing a 'quiet' system. Note that outside the near field boundary in air, if there are no obstructions, sound pressure levels decay 6 DB for each doubling of distance. All sound power and sound pressure levels listed above exclude motors or other auxillary equipment.

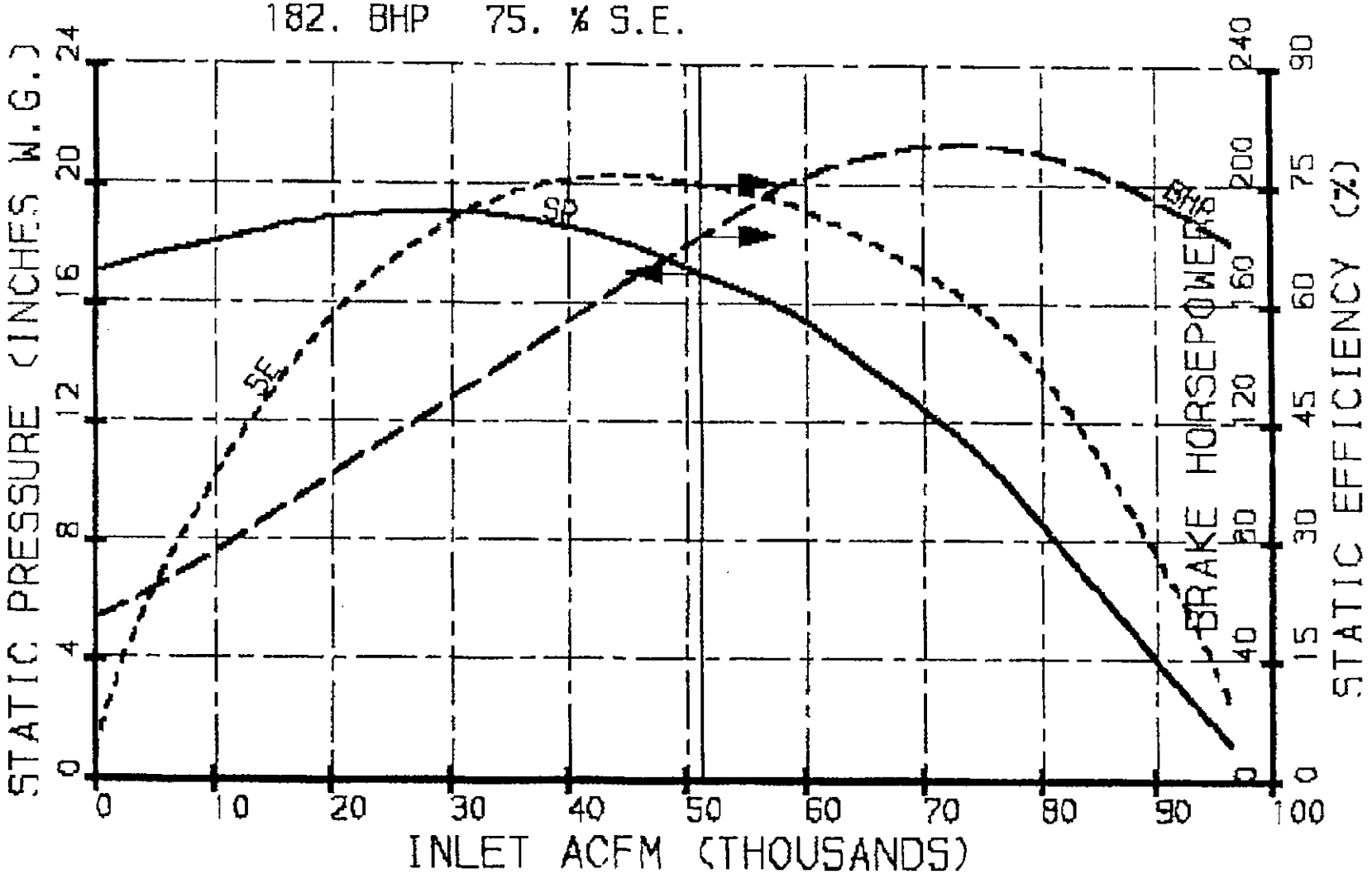
FORM SDF/87/REV 10/15/92

FIGURE 1, I.D. FAN FOR
ACID GAS SCRUBBING SYS.
FOR

DESIGN 51240. ACFM
17.0 IN. W.G. S.P.
182. BHP 75. % S.E.

ANDERSEN 2000 INC.

MODEL 7-BIS-IV (99%)
ARR.#9, CCW, BAU, 1820 RPM
0.0562 #/FT³ INLET DENSITY



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STANDARD CONDITIONS OF SALE

1. **PURCHASE AND SALE.** Upon acceptance of the equipment and/or services sale proposal and quotation (the "Proposal and Quotation") of which these Standard Conditions of Sale are made a part by the Buyer (as identified on the Equipment and/or Services Quotation page), Andersen 2000 Inc. (the "Seller") shall sell and Buyer shall purchase all of the equipment (hereinafter collectively called the "Equipment") described in the Proposal and Quotation for the sale price specified therein in accordance with all of the terms and conditions hereinafter set forth, as well as with all of the other provisions of the Proposal and Quotation. Except where the context requires otherwise, the terms "herein," "hereof," "hereunder," and other words of similar import refer to the Proposal and Quotation as a whole, and not to any particular article, section, paragraph, clause, attachment or other subdivision thereof.

2. **SALE PRICE AND PAYMENT TERMS.** The sale price of the Equipment specified in the Proposal and Quotation does not include any applicable sales, use, excise or other similar taxes imposed by any federal, state, local or other taxing jurisdiction. If any such taxes are imposed with respect to the sale of the Equipment, Buyer shall pay the same. Seller may require that Buyer pay such taxes directly or, in the alternative, Seller may pay the taxes due on behalf of Buyer and obtain reimbursement from Buyer immediately upon Seller's demand. The terms of payment of the sale price of the Equipment are as set forth on the Equipment and/or Services Quotation page. All payments must be made to Seller promptly when due at its Home Office address indicated in the Proposal and Quotation.

3. **DELIVERY AND RISK OF LOSS.** Any delivery made within 30 days after the end of the respective delivery times specified on the Equipment and/or Services Quotation page is to be deemed to be timely. Subject to the Force Majeure provisions of paragraph 9 below, if Seller fails timely to deliver any of the Equipment, Buyer may cancel that portion of the Equipment which has been delayed, such right of cancellation being Buyer's sole remedy for Seller's failure or delay in making delivery. Risk of loss and damage to the Equipment will automatically be transferred and will pass from Seller to Buyer upon delivery or tender of the Equipment at the F.O.B. place of delivery specified on the Equipment and/or Services Quotation page. Except to the extent provided to the contrary in paragraph 9 below, no loss, destruction or other material damage to the Equipment will relieve the party bearing the risk of loss and damage from fully performing its obligations hereunder.

4. **INVOICES.** The Equipment may be delivered, at the discretion of the Seller, in several lots under separate invoices. In such event, Buyer shall promptly pay the proportionate amount of the total sale price of the Equipment represented by each lot indicated in the invoice furnished by Seller respecting such lot.

5. **SECURITY INTEREST.** As security for the full and prompt payment of the sale price of the Equipment, as well as of all other amounts now or hereafter owing by Buyer to Seller of whatever nature, Buyer grants to Seller a present and continuing first priority, purchase money security interest in the Equipment. If Buyer fails promptly to pay, when due, any amount payable hereunder, then Seller may, without any notice or demand of any kind and notwithstanding any other provisions or agreements to the contrary, declare all amounts when owing by Buyer to Seller to be due and payable, whereupon the same will immediately become due and payable; and Seller may exercise from time to time all rights and remedies available to it hereunder or available under applicable law or in equity. Buyer shall pay all costs and expenses incurred by Seller in collecting any amount owing by Buyer to Seller (including, but not limited to, reasonable attorney's fees, if collected by or through an attorney at law).

6. **WARRANTIES.**

(A) **Limited Warranty of Equipment Manufactured by Seller.** Subject to the limitations hereinafter set forth, Seller warrants to Buyer that all items of the Equipment manufactured by Seller will be free from defects in material and workmanship under normal use and service for a period of 18 months after the date of delivery or tender of the Equipment to Buyer, or 12 months after the date that the Equipment is ready for commencement of initial operation by Buyer, whichever occurs first; provided, however, that (i) the Equipment must at all times have been operated in accordance with Seller's operating instructions and in accordance with the conditions for which the same are designed and (ii) no alterations or substitutions have been made in the Equipment. Further, and without limiting the foregoing, the limited warranty herein given by Seller will be rendered void by the improper erection of the Equipment by parties other than Seller or by damage to the Equipment after transfer and passage of the risk of loss from Seller to Buyer (including, but not limited to, damage caused by abrasion, corrosion, excess temperature or improper use). Buyer shall make all claims of any nature whatsoever for breach of the foregoing limited warranty, regardless of whether a defect is patent or latent, by written notice to Seller within 10 days after Buyer discovers such defect, setting forth in detail the nature of defect. Buyer's right to make claims for breach of said limited warranty will terminate upon the expiration of such notice period, and all claims for defects will thereafter be barred. Upon Buyer's making a satisfactory written proof of claim with Seller, Seller may fully discharge its obligations under this limited warranty by making any necessary repairs or, at Seller's option, supplying replacement parts within a reasonable period of time thereafter, all at Seller's expense. No payment or allowance will be made for labor costs, parts or other charges of Buyer or of third parties for making repairs or replacements, nor will Seller accept Equipment returned for credit, unless written authorization is obtained in advance from Seller.

(B) **Limited Patent Warranty Respecting Equipment Manufactured by Seller.** Seller shall defend, at its expense, any suit or proceeding brought against Buyer which asserts any claim that any Equipment manufactured by Seller infringes any United States patent which was issued as of the date of the Proposal and Quotation, and Seller shall pay any damages and costs awarded therein against Buyer up

(continued on next page)

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STANDARD CONDITIONS OF SALE (continued)

to, but not to exceed, the aggregate amount of the sale price of the infringing Equipment theretofore paid by Buyer to Seller, provided, however, Buyer must give Seller written notice of any such claim within 10 days after Buyer is notified thereof; and provided further that Buyer must thereafter fully cooperate with Seller and give Seller all authority, information and assistance as Buyer is able to give in order to allow Seller to conduct such defense effectively and efficiently. If the use of any of the Equipment is enjoined as a result of any such suit, Seller shall, at its option and at its expense, procure for Buyer the right to use such Equipment, or modify the infringing Equipment so that it no longer infringes any United States patent, or replace the infringing Equipment with non-infringing Equipment, or refund the portion of the sale price attributable to the infringing Equipment.

© **Equipment Not Manufactured by Seller.** All Equipment which is not manufactured by Seller is sold AS-IS and carries only such warranties as are given by the manufacturer thereof (if any), which warranties (if any) are, to the extent permitted by their terms, hereby assigned by Seller to Buyer without recourse against Seller.

7. **LIMITATION OF WARRANTIES, REMEDIES AND OBLIGATIONS.** EXCEPT AS OTHERWISE EXPRESSLY PROVIDED HEREIN, THE EQUIPMENT IS BEING SOLD AS-IS, AND SELLER MAKES NO WARRANTIES OF ANY NATURE WHATSOEVER WITH RESPECT TO THE EQUIPMENT, ORAL OR WRITTEN, EXPRESS OR IMPLIED (INCLUDING, BUT NOT LIMITED TO, THOSE OF MERCHANTABILITY AND FITNESS OF USE FOR A PARTICULAR PURPOSE); AND SELLER HEREBY DISCLAIMS ANY WARRANTY NOT EXPRESSLY SET FORTH HEREIN. SELLER'S ONLY OBLIGATIONS FOR BREACH OF WARRANTY ARE AS SET FORTH HEREIN. SELLER WILL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE ARISING IN CONNECTION WITH THE EQUIPMENT, OR IN CONNECTION WITH SELLER'S PERFORMANCE OR BREACH OF ITS OBLIGATIONS HEREUNDER, REGARDLESS OF WHETHER BASED IN CONTRACT OR IN TORT, (INCLUDING, BUT NOT LIMITED TO, *LOSS OF PROFITS*, PLANT DOWN TIME, LOSS OF USE OF THE EQUIPMENT, AND CLAIMS, SUITS AND DAMAGES OF THIRD PERSONS, EXCEPT FOR U.S. PATENT INFRINGEMENT CLAIMS TO THE EXTENT PROVIDED IN CLAUSE (B) OF PARAGRAPH 6 ABOVE). IN NO EVENT WILL SELLER'S LIABILITY FOR PERFORMANCE OR BREACH OF ANY OF ITS OBLIGATIONS HEREUNDER EXCEED THE AMOUNT OF THE SALE PRICE THERETOFORE PAID BY BUYER TO SELLER. SELLER NEITHER ASSUMES NOR AUTHORIZES ANYONE TO ASSUME FOR IT ANY OTHER OBLIGATION OR LIABILITY OF ANY NATURE WHATSOEVER OR TO MAKE ANY ADDITIONAL REPRESENTATION OR WARRANTY NOT HEREIN CONTAINED RESPECTING THE EQUIPMENT OR SELLER'S OBLIGATIONS. By way of illustration, and not in limitation of the foregoing, no communication, representation or statement made by any sales agent or representative of Seller respecting the performance or operation of the Equipment, or otherwise, is binding upon Seller (the sole and exclusive warranties, representations and obligations of Seller being set forth herein). Further, Seller makes no representation or warranty that the Equipment complies with, or that it will perform or operate in accordance with, the requirements of any law, code, statute, regulation, rule or ordinance of any federal, state, local or other governmental authority (including, but not limited to, any pollution control agency). Seller neither undertakes nor has any obligation to obtain permits, licenses or approvals from any such governmental authority or agency concerning the Equipment or concerning the installation, operation or use thereof. Only such safety devices as are specified in the Proposal and Quotation will be furnished by Seller to Buyer. Buyer shall, at its expense, obtain and install all other safety devices required or desirable due to the nature of the Equipment or due to Buyer's operation of the Equipment. Seller hereby disclaims, and Buyer hereby releases Seller from, all liability arising out of the improper use of the Equipment or from the absence of proper safety devices respecting the Equipment. In no event will Seller be liable for any claim, loss, damage or expense arising out of the sole or contributory negligence of Buyer, its employees, agents, engineers, architects, or other contractors, and Buyer shall indemnify, defend and save Seller harmless therefrom (including, but not limited to, payment of Seller's reasonable attorneys' fees).

8. **PERFORMANCE LEVELS GUARANTY AND ACCEPTANCE TESTS.** In the event that the Equipment and/or Services Quotation page specifies that the provisions of the Performance Levels Guaranty and Acceptance Tests are applicable and the same are included as a part of the Proposal and Quotation, but only in such event, then Seller shall perform all of the additional obligations set forth therein. If the provisions of the Performance Levels Guaranty and Acceptance Tests are applicable, then wherever possible the provisions of these Standard Conditions of Sale are to be construed so as to be consistent with the provisions thereof; but in the event of any irreconcilable inconsistencies, the provisions of the Performance Levels Guaranty and Acceptance Tests will always prevail, govern and control.

9. **FORCE MAJEURE RESPECTING DELIVERIES BY SELLER.** All deliveries by Seller are contingent upon Seller's receiving necessary materials, parts, and components for its manufacture, assembly or supply of the Equipment to Buyer; and Seller's deliveries to Buyer may be delayed, reduced or cancelled to the extent affected by delay, reduction or cancellation of shipments thereof from Seller's suppliers. Seller will not be liable for any default, delay, reduction or failure in delivery attributable thereto or attributable to strikes, lock-outs, disputes or disagreements resulting in labor stoppages, plant shutdowns or slowdowns at the facilities of Seller or elsewhere, government regulations, embargo, lack or failure of shipping facilities, military service, war, delays by carriers, casualties, fires, earthquakes, floods, storms, explosions, epidemics, civil commotion or disturbances, acts of God or any other causes or conditions, whether similar or dissimilar to those enumerated, beyond the reasonable control and without the negligence of the Seller. In such circumstances, the time for delivery by Seller will automatically be extended for the period of time Seller is delayed as a result thereof.

(continued on next page)

ANDERSEN 2000 INC.
306 DIVIDEND DRIVE - PEACHTREE CITY, GEORGIA 30269 USA
(A CROWN ANDERSEN INC. COMPANY)

STANDARD CONDITIONS OF SALE (continued)

10. MISCELLANEOUS. All rights and remedies of Seller, whether provided for herein, or conferred by law, or in equity, or by statute, or otherwise are cumulative and not alternative, and can be enforced successively or concurrently. This Agreement cannot be amended except by a subsequent writing signed by Seller. Seller will not be deemed to have waived any of its rights or remedies hereunder unless such waiver is in writing and signed by Seller. No delay or omission by Seller in exercising any of its rights or remedies is to be deemed to be a waiver thereof, and a waiver in writing on one occasion will be effective only in that specific instance and only for the precise purpose for which given. All communications hereunder must be in writing and are to be deemed to have been duly given and to be effective upon delivery to the party to whom directed. Communications that are sent by U.S. mail, first class, certified, return receipt requested, postage prepaid, are to be deemed to have been delivered 3 days after being so posted. None of Buyer's obligations hereunder may be assigned or delegated without the prior written consent of Seller. All of the provisions hereof will be binding upon and will inure to the benefit of both parties, and their respective successors and permitted assigns. Each of the provisions hereof is severable from each of the others; and if any provision hereof is prohibited or unenforceable under applicable law, such provision will be ineffective only to the extent of such prohibition or unenforceability without invalidating the remainder thereof or the remaining provisions hereof. The captions herein are for convenience of reference only and are not to be used in construing the provisions hereof. The Proposal and Quotation is made, and the contract contemplated hereby is to be substantially performed, in the State of Georgia, and all of the provisions hereof are in all respects (including, but not limited to, all matters of construction, interpretation, validity, enforcement, performance and the consequences of breach) to be construed in accordance with and governed by the internal laws (excluding all conflict of law rules) of that State (including, but not limited to, the Uniform Commercial Code of Georgia), as from time to time amended and in effect, and the applicable internal federal laws of the United States of America, as from time to time amended and in effect.

III. DESIGN SPECIFICATIONS AND ASSUMPTIONS

Andersen 2000 Inc. has built acid gas scrubbing systems throughout the world on various industrial and utility applications. The company is the largest supplier of packaged sulfur dioxide and HF scrubbing systems in the world, primarily for industrial plants. Based on this experience, and on the basis of data given to Andersen for this application, we have developed the following specifications for this scrubbing system.

1. Scrubber Inlet Gas Temperature = 400°C

2. Exhaust Gas From The Kiln At Maximum Gas Flow =

   63,129 acfm @ 400°F and -7" H_2O at 700' above sea level

3. Gas Composition Assumed For These Calculations:

Particulate	= 126 #/hr
O_2	= 7,138.78 #/hr
N_2	= 100,986.59 #/hr
CO_2	= 30,523.41 #/hr
H_2O	= 20,615.79 #/hr
SO_2	= 1,703.2 #/hr
HF	= 1,734.4 #/hr
HCl	= 12.64#/hr

4. SO_2 Removal Efficiency = 95%
   HF Removal Efficiency = 99%
   HCl Removal Efficiency = 99%

5. Particulate removal efficiency will be about 25% based on typical size distribution for the kiln dust.

6. Total scrubber differential pressure is 10" (254 mm) W.G.

7. Makeup Water Assumed to Scrubber:

   MAKEUP WATER ANALYSIS (UNFILTERED & UNSOFTENED)

pH	=	7.0
Chlorides (Cl)	=	50 ppm (wt)
Temperature	=	70°F

8. Motive force for exhaust gas through scrubber will be supplied by system I.D. fan quoted.

9. We have assumed use of soda ash (sodium carbonate) solution as the sodium makeup source and pebble lime as the reactant in the double alkali system.

IV. PROCESS DESCRIPTION

A. Scrubbing System

The process flow sheet and material balance drawing is included as Drawing P8229-L. Using this drawing, the Andersen acid gas removal process can be described as follows:

Inlet gas is introduced to a quench inlet section preceding the absorption section. Scrubbing liquid is introduced to this quench section to insure that the gas has been saturated. A damper is incorporated into the quench section to allow control of exhaust pressure from the kiln. The gas is quenched with an aqueous scrubbing solution containing sodium fluoride, sodium chloride, sodium hydroxide, sodium sulfite, sodium bisulfite and sodium sulfate. The exhaust gas from the inlet section enters a spray-baffle-type vertical gas scrubber where entrained liquor is removed, and where the gas contacts fresh scrubbing liquor for additional acid gas absorption. The gas encounters six baffles in passing through the absorber unit and then exits through a chevron type mist separator to the stack. Scrubbing liquor to the inlet section and to the spray-baffle-type absorption chamber is supplied from a stud mounted recirculation tank and pump. This same pump also provides for a bleed liquor stream, which must be taken to regeneration. Combined inlet section scrubbing liquor and spray-baffle-type gas absorber scrubber liquor are discharged by gravity back into the recirculation tank. Soda ash (30% wt) is supplied to the recirculation tank as necessary to maintain a reasonable concentration of sodium sulfite and sodium bisulfite in the scrubbing loop after regeneration.

The scrubbing liquor is maintained at a pH of between 6.3 and 7.0 at optimum conditions. At this pH, and at the concentration of sodium sulfite, sodium sulfate and sodium bisulfite indicated in Drawing P8229-1, the scrubbing solution is highly buffered against substantial pH change. As a result, larger variations in inlet sulfur dioxide concentration can be tolerated with very little effect on outlet sulfur dioxide concentration. The sodium sulfite-bisulfite buffer system is highly resistant to pH change. In addition, because the system operates in an acidic condition at all times, calcium scale formation, from calcium contained in the makeup water, is eliminated. In addition, at this pH, CO_2 absorption is minimal and the carbonate-bicarbonate absorption reactions do not take place.

Chemical utilization is essentially 100%. The soda ash reacts with dissolved sulfur dioxide, HF and HCl to form sodium sulfite, sodium chloride and sodium fluoride. If additional sulfur dioxide is then absorbed, it reacts with the sodium sulfite to form the more acidic sodium bisulfite. In addition, oxygen dissolved in the scrubbing solution reacts with the sodium sulfite to oxidize it to sodium sulfate. A small amount of the sulfur dioxide is ultimately converted to sodium sulfate by this oxidation reaction. A bleed stream is taken from the scrubbing system to regeneration to maintain a relatively constant sodium sulfite, sulfate, and bisulfite concentration.

The concentrations of sulfite, sulfate and bisulfite in the scrubbing solution were selected to give a dissolved solids content which would prevent any substantial pH fluctuation during normal operation, but which would not create problems with chemical salt formation during cold operating conditions. If the concentrations of these chemical components are increased, cold weather will sometimes precipitate salts, and these will plug up some of the piping in the system. If the system is operated with more dilute scrubbing liquor, a higher bleed rate is required to get rid of the absorbed sulfur dioxide, and the system is less well buffered against pH changes. In addition, at the concentrations selected for this application, the inventory of scrubbing liquor in the recirculation tank is sufficient to continue to absorb sulfur dioxide for at least one hour, even if no soda ash or regenerated liquid is fed to the system.

The scrubber piping and instrumentation system is discussed below:

Gas from the kiln first enters the quench section. At the inlet to this section, temperature indicators are used to indicate temperature of the incoming gas stream. A pressure switch is also mounted on each inlet gas duct to operate in the event of scrubber pluggage, initiating a bypass of the scrubbing system, and also activating an alarm on the control panel. A differential pressure indicator is included in the PLC in the control panel to monitor the differential pressure across the entire scrubbing system. In addition, a differential pressure indictor is provided to monitor inlet pressure to the scrubber. The quench section requires a very low differential pressure. Total differential pressure across the scrubber is 10" W.G. Approximately 1.5" W.G. of this differential pressure occurs across the mist eliminator.

Scrubbing liquor is supplied to the inlet section and the baffle scrubber by a centrifugal pump. The quench liquor is fed through a single pipe and multiple nozzles into the quench section. Multiple liquid nozzles are used to introduce the liquid into the absorber section. Manual control valves are installed on each of the main lines feeding the individual nozzles. In addition, a pressure switch is installed on the feed pump discharge and is actuated if the liquid pressure drops to a predetermined low set point. This switch activates a low pressure alarm to warn of impending pump failure, and is connected to the backup pump system. A pressure indicator is also mounted on each pump discharge line to give local pressure readings.

A rotameter is provided on the blowdown from the scrubbing system to monitor blowdown rate to regeneration. This flow is automatically controlled by a density control system. The necessary check valves and isolation valves are included.

Scrubbing liquor for the spray-baffle-type scrubber and the quench section is supplied through a vortex-shedding flowmeter to the various nozzles at the use points. The recirculation tank maintains adequate scrubber inventory for the feed pump. The scrubbing liquor returned from the scrubber is discharged by gravity into this tank. A water makeup line is connected to this tank to make up for evaporative losses and for the liquor which is lost to the bleed stream. The water makeup line is connected to a float actuated diaphragm valve, which is pilot operated, and which is used to maintain level in the tank. In the event the water makeup to the system fails, the recirculation pump would ultimately run out of liquor to supply to the scrubbing system, and both the pressure switch and the temperature switch in the scrubber discharge would actuate an alarm and could actuate the steam boiler shutdown system. As additional protection, a low tank level switch is provided with a level alarm which is connected to the bypass sequencer. Temperature and pressure indicators are provided on the scrubber gas discharge.

A bypass liquid stream is taken from the spray-baffle-type scrubber recirculation line through a pH monitoring cell. The flow to the pH monitoring cell is directed through a rotameter with a manual valve so that flow can be adjusted by the operator of the equipment on an occasional basis. The pH cell produces a signal which is transmitted by a pH transmitter to the pH controller on the control panel. This controller is a proportional controller which controls a variable speed controller on the soda ash feed pump. This controller meters soda ash into the recirculation tank to maintain proper pH. Should the soda ash supply fail, a low pH alarm will sound, and this alarm is connected to the shutdown system. In addition, a high pH alarm is provided to alarm in the event of pH controller failure. This is also connected into the shutdown sequencer. A pressure gauge is provided in the soda ash feed line for local pressure readings. A temperature indicator is also provided to give local temperature readings.

B. Liquid Regeneration System

The regeneration system has been designed to operate unattended 24 hours/day 365 days/year. The system is equipped with automatic startup and shutdown sequencers to handle variations in liquid flow rates from the scrubbing system. The regeneration system is designed to operate on a constant liquid flow rate so that it is simply shut off when inadequate liquid is available to be processed, and it is turned back on when sufficient inventory of liquid is available. The system is skid mounted, pre-piped, pre-wired, and fully instrumented to the maximum extent possible prior to shipment to the job site from Andersen's plant. It is then reassembled on the foundation provided by the customer, piping spools are connected and the system is started up. The chemical reactions which take place in the system are discussed in Section I of this proposal.

Drawing P8229-1 shows the flowsheet and material balance for this plant. Drawings P8229-3 through -5 show the Model 5000 liquid waste regeneration system.

Liquid is pumped from the scrubbing system to the holding tanks preceding the regeneration system. These tanks are constructed of corrosion resistant materials and hold sufficient waste liquid to operate the regeneration system on a relatively continuous basis. Liquid is pumped from these tanks at a constant rate to the lime reactor. In the lime reactor, pebble lime is introduced to a draft-tube type reactor where a turbine-type agitator is used to force the pebble lime to mix with the scrubbing solution and react with it. The chemical reaction is exothermic, elevating the temperature of the liquid in the tank and maintaining an elevated temperature for operating conditions. The reacted liquid overflows from this reactor by gravity into a Lamella type gravity settler. Here the solid material separates from the liquid and concentrates in the bottom of the settler. Clear liquid overflows from the top of the settler and is routed to a storage tank. A slurry containing approximately 16% (wt) solids is taken off the bottom of the settler and pumped, using an air operated diaphragm pump, into a rotary drum vacuum filter. The rotary vacuum, filter separates the solids away from the bulk of the carrier liquid. The solids are then discharged, using

a scraper blade, down a chute into a storage hopper, which is provided by the customer. Vacuum across the rotary vacuum filter is provided by a water sealed vacuum pump mounted adjacent to the filter. A vacuum receiver is used to separate the liquid in the vacuum line from the air. The vacuum pump discharges through a silencer to minimize noise and to also remove any residual water and any seal flush water which is fed to the pump. An automatic seal-flush water package is provided with this system to provide for the necessary seal-flush water to the vacuum pump and to other centrifugal pumps in the system. A filtrate pump draws the filtered liquid from the vacuum receiver and pumps it into a storage tank. This is the same storage tank that the thickener overflows into. A high pressure pump then draws this liquid from the holding tank, forces it through polishing filters to remove any residual lime compounds which might still be present, and then delivers the liquid to additional storage tanks.

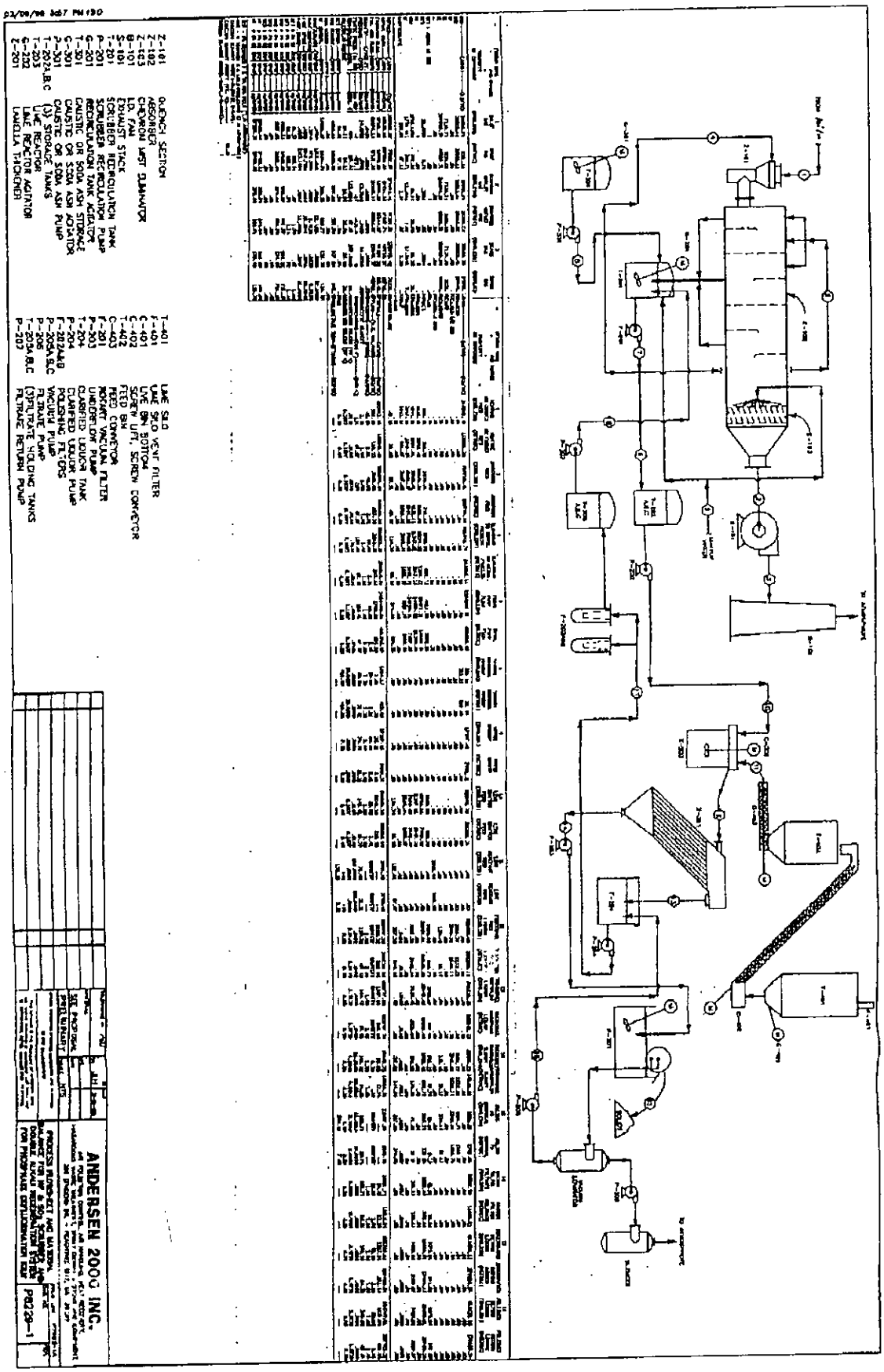
Solids feed is accomplished by storage in a large silo adjacent to the chemical reactor. The storage silo is equipped with a live bin bottom and a vibrator to feed into a screw conveyor and a screw lift which feed the pebble lime into an interim storage bin above a vibrating screw conveyor. The vibrating screw conveyor speed is controlled by a pH controller in the lime reactor. The equipment is described in the drawings referenced above.

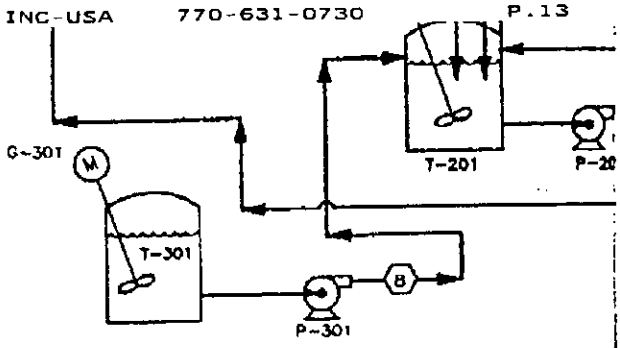
The instrumentation system can be described as follows:

A liquid level switch is installed in the storage tank about two-thirds of the way up the wall. When the liquid level exceeds this level switch height, an automatic start sequence is initiated for all of the equipment in the system. The filtration system is first started, followed by the system feed pump. In this fashion, all of the processing equipment is brought up to speed before a surge of fresh scrubbing liquid for regeneration enters the system. Flow into the lime reactor is monitored by a vortex-shedding flowmeter. Temperature in the reactor is monitored by a thermocouple and temperature readout. The lime reactor agitator is left on at all times to prevent solids deposition in the bottom of the tank, even when scrubbing liquid is not being fed to the system. Because the lime reactor operates on an overflow basis, it always contains liquid, even if scrubbing liquid is not being fed to the system. A pH monitor is installed in a well in the overflow pipe from the lime reactor. This pH monitor transmits its signal to a pH controller mounted in the control panel. The pH is set at approximately 9 to insure complete neutralization of all bisulfite in the scrubbing system. The pH controller sends a 4-20 ma signal to a speed controller on an AC drive motor on a vibrating rotary screw conveyor. This conveyor feeds pebble lime into the lime reactor at a rate determined by the pH controller. Above this vibrating screw feeder, an interim storage tank is provided with both low and high level switches. When the low level switch is reached, indicating the lime supply is being depleted, a screw conveyor and screw lift in a live bottom bin on the storage silo are automatically turned on to feed pebble lime into the interim storage bin until the high level switch is actuated. When the high level switch is actuated, the conveyors are turned off.

The regenerated scrubbing liquid, before filtration, is fed to a thickener where the solids are separated from the bulk of the liquid. A thick slurry underflow is taken from the thickener through an air operated diaphragm pump into the rotary vacuum filter. The feed rate of this thickener underflow liquid is determined by the liquid level in the rotary vacuum filter tank. Pump stroke frequency is controlled by air pressure to the pump, based on the level controller in the rotary vacuum filter tank.

After the liquid has been filtered, the clear liquid is taken to a vacuum receiver where the liquid is separated from the air. The air is exhausted by a vacuum pump to a silencer. Seal water is provided to the vacuum pump from a small seal water package. The liquid is drawn from the vacuum receiver by a self-priming centrifugal pump and is transmitted to an additional storage tank where the clear liquid is stored for transmission back to the scrubbing system. A level controller in the storage tank transmits its signal to a control valve on the discharge of a high pressure pump which draws liquid from this tank, pumps it through the polishing filters and delivers it to the scrubbing system. This level control system maintains essentially constant liquid level in the storage tank. The liquid is then sent to a larger capacity holding tank before being fed back to the scrubbing system. All automatic systems in the instrumentation circuit are equipped with selector switches, allowing manual operation. In addition, all critical alarm points also actuate the automatic shutdown sequencing.


ANDERSEN 2000 INC.
PROCESS FLOW SHEET
P8129-1



STREAM NAME AND NUMBER / PROPERTY OR COMPONENT	1 INLET GAS (ENGLISH)	INLET GAS (METRIC)	2 SCRUBBER OUTLET GAS (ENGLISH)	SCRUBBER OUTLET GAS (METRIC)	3 STACK GAS (ENGLISH)	STACK GAS (METRIC)	ST
H2O----------(#/HR)----------(Kg/HR)	20615.79	9351.12	33940.74	15395.18	33940.74	15395.18	H2O
CO2	30523.41	13845.12	30523.41	13845.12	30523.41	13845.12	Na2CO3
O2	.00	.00	.00	.00	.00	.00	CaSO3-1/2 H2O
N2	7138.78	3238.08	7138.78	3238.08	7138.78	3238.08	CaF2
AR	100986.59	45806.51	100986.59	45806.51	100986.59	45806.51	Ca(OH)2
SO3 & MISCN AS SO3	.00	.00	.00	.00	.00	.00	CaSO4-2 H2O
HCl	0	.00	0	.00	0	.00	CaO
NO	12.6439	5.74	.1264	.06	.1264	.06	NaCl
SOX	0	.00	.00	.00	0	.00	Na2SO3
HF	1703.1998	772.55	85.16	38.63	85.16	38.63	NaHSO3
PARTICULATE	1734.411	786.71	17.3441	7.87	17.3441	7.87	Na2SO4
	126.00	57.15	1.26	.57	1.26	.57	NaF
TOTALS----------(#/HR)----------(Kg/HR)	162840.83	73852.97	172693.42	78332.01	172693.42	78332.01	PARTICULATE
ACTUAL FLOW----(ACFM)----------(M3/HR)	63129.06	107268.89	51234.55	87057.74	49310.87	83784.52	
STANDARD FLOW---(SCFM)----------(NCU/HR)	37281.66	56776.64	41296.35	65140.17	41296.35	68140.87	TOTALS
STD. DRY FLOW-(SDCFM)----------(NM3D/HR)	29879.14	47131.38	29142.17	45968.87	29142.17	45968.87	FLOW---(U.S. GA
DENSITY----(#/CU.FT.)----------(Kg/M3)	.0430	.6888	.0562	.8998	.0584	.9348	PRESSURE
PRESSURE----------(PSIA)----------(Kg/cm2)	14.0752	.9702	13.7140	.9453	14.3280	.9879	SPECIFIC GRAVITY
STATIC PRESS.(in H2O)----------(mm H2O)	-7	-177.8	-17	-431.8	0	0	TEMPERATURE---(F
TEMPERATURE---(DEG. F)----------(DEG. C)	400	204.44	153.6095	67.57	157.0095	69.446	SPECIFIED SOLIDS
MOLECULAR WEIGHT	28.15	28.15	26.95	26.95	26.95	26.95	DISSOLVED SOLIDS
HCl CONCEN.----(PPMV)----------(mg/NM3)	59.92	97.68	.54	.88	.54	.88	gr/s
SO2 CONCEN.----(PPMV)----------(mg/NM3)	4603.41	13143.93	207.68	592.99	207.68	592.99	VOLUMETRIC FLOW
SO3 CONCEN.----(PPMV)----------(mg/NM3)	.00	.00	.00	.00	.00	.00	
HF CONCEN.----(PPMV)----------(mg/NM3)	19000.87	13384.79	135.35	120.77	135.35	120.77	
PARTICULATE-(GR/SDCF)----------(mg/NM3D)	.4920	1212.6181	.0050	12.4328	.0050	12.4328	
PART.812#CO2-(GR/SDCF)----------(mg/NM3D)	.3845	972.3808	.0039	9.7238	.0039	9.7238	
PART.#7402---(GR/SDCF)----------(mg/NM3D)	.4251	1047.7264	.0044	10.8241	.0044	10.8241	
PART.#4402---(GR/SDCF)----------(mg/NM3D)	.4557	1123.1026	.0047	11.6028	.0047	11.6028	
NO1 @ 7% O2 DRY(PPMV)----------(mg/NM3D)	84.87	105.14	.67	1.09	.67	1.09	
NO1 @ 6% O2 DRY(PPMV)----------(mg/NM3D)	69.81	111.79	.72	1.16	.72	1.16	
SO2 @ 7% O2 DRY(PPMV)----------(mg/NM3D)	4960.19	14182.60	256.22	732.57	256.22	731.57	
SO2 @ 6% O2 DRY(PPMV)----------(mg/NM3D)	5317.03	16181.49	274.65	784.20	274.65	784.20	
SO3 @ 7% O2 DRY(PPMV)----------(mg/NM3D)	.00	.00	.00	.00	.00	.00	
SO3 @ 6% O2 DRY(PPMV)----------(mg/NM3D)	.00	.00	.00	.00	.00	.00	
HF @ 7% O2 DRY(PPMV)----------(mg/NM3D)	18163.46	14422.13	164.99	149.00	164.99	149.00	
HF @ 6% O2 DRY(PPMV)----------(mg/NM3D)	17326.30	15459.69	179.00	158.71	179.00	159.71	

SCF = 70 DEGREES F & 14.696 PSIA (1.0 ATMOSPHERE)
NM3 = 0 DEGREES C & 1013 MILLIBARS (1.0 ATMOSPHERE)
CALCIUM REAGENT USED(1=Ca(OH)2,2=CaO): 2
CALCIUM REAGENT PURITY (WT. %)----------: 96.00
SODIUM REAGENT USED(1=NaOH,2=Na2CO3)-: 2

Z-101	QUENCH SECTION	T-401
Z-102	ABSORBER	F-401
Z-103	CHEVRON MIST ELIMINATOR	C-401
B-101	I.D. FAN	C-402
S-101	EXHAUST STACK	T-402
T-201	SCRUBBER RECIRCULATION TANK	C-403
P-201	SCRUBBER RECIRCULATION PUMP	F-201
G-201	RECIRCULATION TANK AGITATOR	P-203
T-301	CAUSTIC OR SODA ASH STORAGE	T-204
G-301	CAUSTIC OR SODA ASH AGITATOR	P-204
P-301	CAUSTIC OR SODA ASH PUMP	F-202
T-202A,B,C	(3) STORAGE TANKS	P-205
T-203	LIME REACTOR	P-206
G-202	LIME REACTOR AGITATOR	T-205
Z-201	LAMELLA THICKENER	P-207

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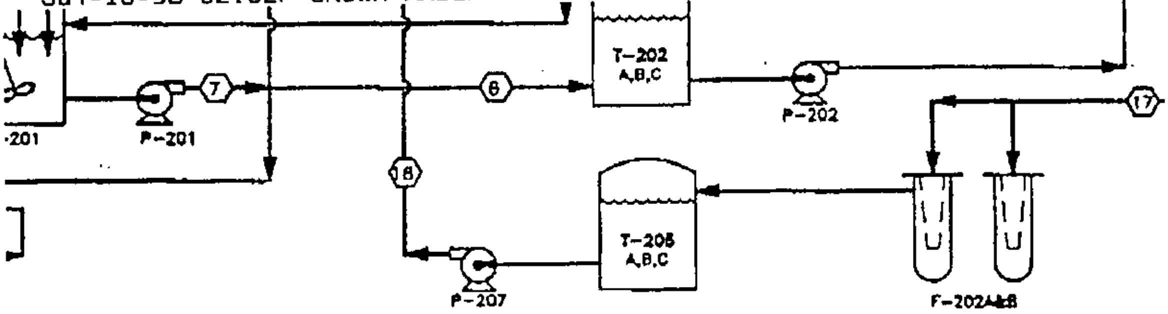
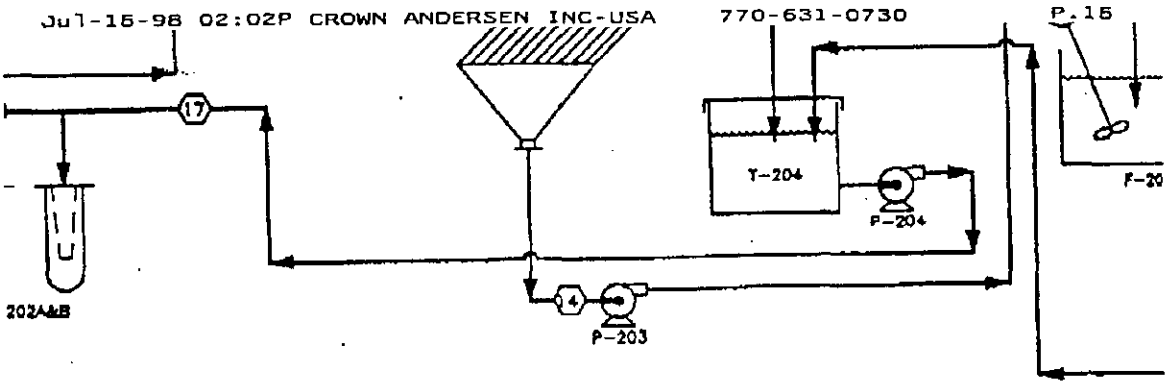


[cut off] STACK GAS (METRIC)	STREAM NAME AND NUMBER / PROPERTY OR COMPONENT	4 VENTURI OR QUENCH FEED (ENGLISH)	VENTURI OR QUENCH FEED (METRIC)	5 ABSORBER FEED (ENGLISH)	ABSORBER FEED (METRIC)	6 BLOWDOWN TO REGEN. PROCESS (ENGLISH)	BLOWDOWN TO REGEN. PROCESS (METRIC)	7 TOTAL PUMP FLOW (ENGLISH)	TOTAL PUMP FLOW (METRIC)	8 SODIUM CHEMICAL MAKEUP (ENGLISH)	SODIUM CHEMICAL MAKEUP (METRIC) [cut off]
1388.18	H2O —(#/HR)— —(Kg/HR)	248899.40	112898.24	497790.31	225796.56	621541.79	281925.14	1368240.81	620610.98	730.92	33
1041.12	Na2CO3	.00	.00	.00	.00	.00	.00	.00	.00	313.25	14
.00	CaSO3-1/2 H2O	.00	.00	.00	.00	.00	.00	.00	.00	.00	
238.02	CaF2	.00	.00	.00	.00	.00	.00	.00	.00	.00	
1806.81	Ca(OH)2	.00	.00	.00	.00	.00	.00	.00	.00	.00	
.08	CaSO4-2 H2O	.00	.00	.00	.00	.00	.00	.00	.00	.00	
.00	CaO	.00	.00	.00	.00	.00	.00	.00	.00	.00	
.06	NaCl	839.35	380.72	1678.71	761.43	2096.00	950.73	4614.06	2092.89	.00	
.00	Na2SO3	6489.19	2943.43	12978.38	5886.86	16204.65	7350.22	35672.11	16180.51	.00	
38.63	NaHSO3	4544.20	2061.21	9088.41	4122.41	11347.61	5147.16	24980.22	11330.78	.00	
7.47	Na2SO4	3047.08	1382.13	6094.17	2764.25	7609.06	3451.39	16750.31	7597.77	.00	
.57	NaF	1443.98	654.97	2887.95	1309.95	3605.84	1635.57	7937.77	3600.49	.00	
—	NaOH	.00	.00	.00	.00	.00	.00	.00	.00	.00	
332.91	PARTICULATE	49.95	22.66	99.91	45.32	124.74	56.58	274.60	124.56	.00	
788.:3											
140.97	TOTALS —(#/HR)— —(Kg/HR)	265313.18	120343.40	530626.33	240686.80	662529.59	300516.80	1458469.08	661546.99	1044.17	47
968.8	FLOW —(U.S. GAL/MIN)— —(M3/HR)	500.00	113.55	1000.00	227.10	1248.68	283.55	2748.58	624.20	1.41	
.9345	PRESSURE —(PSIG)— —(Kg/cm2)	40.00	2.81	40.00	2.81	40.00	2.81	40.00	2.81	30.00	
.9878	SPECIFIC GRAVITY	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.30	
0	TEMPERATURE —(DEG F)— —(DEG C)	154	67.57	154	67.57	153.61	67.57	153.61	67.57	90.00	3
69.48	SUSPENDED SOLIDS (WT %)	.0188	.0188	.0188	.0188	.0188	.0188	.0188	.0188	.0000	.
26.95	DISSOLVED SOLIDS (WT %)	6.1677	6.1677	6.1677	6.1677	6.1677	6.1677	6.1677	6.1677	30.0000	30.
.88	pH	6.80	6.80	6.80	6.80	6.80	6.80	6.80	6.80	>14.00	>1
892.88	VOLUMETRIC FLOW—(FT3/HR)— —(M3/HR)	—	—	—	—	—	—	—	—	—	

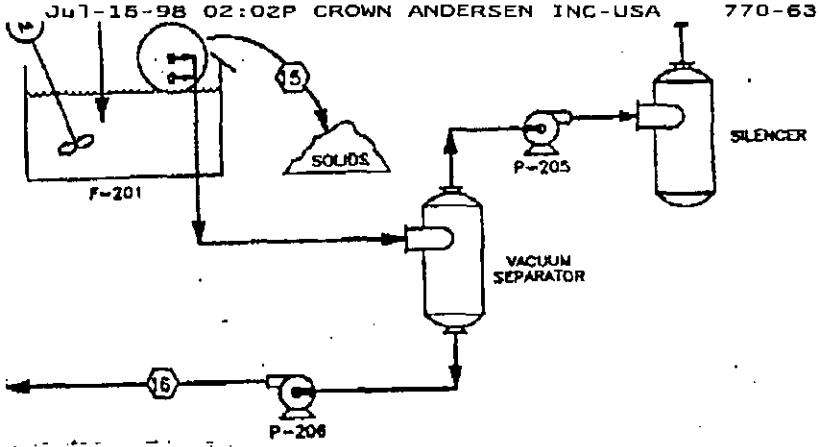
.00
120.77
1.4328
1.7238
1.8241
1.0028
1.00
1.16
31.57
84.30
.00
.00
49.00
88.71

T-401 LIME SILO
F-401 LIME SILO VENT FILTER
C-401 LIVE BIN BOTTOM
C-402 SCREW LIFT, SCREW CONVEYOR
T-402 FEED BIN
C-403 FEED CONVEYOR
F-201 ROTARY VACUUM FILTER
P-203 UNDERFLOW PUMP
T-204 CLARIFIED LIQUOR TANK
P-204 CLARIFIED LIQUOR PUMP
F-202A&B POLISHING FILTERS
P-205A,B,C VACUUM PUMP
P-206 FILTRATE PUMP
T-205A,B,C (3)FILTRATE HOLDING TANKS
P-207 FILTRATE RETURN PUMP



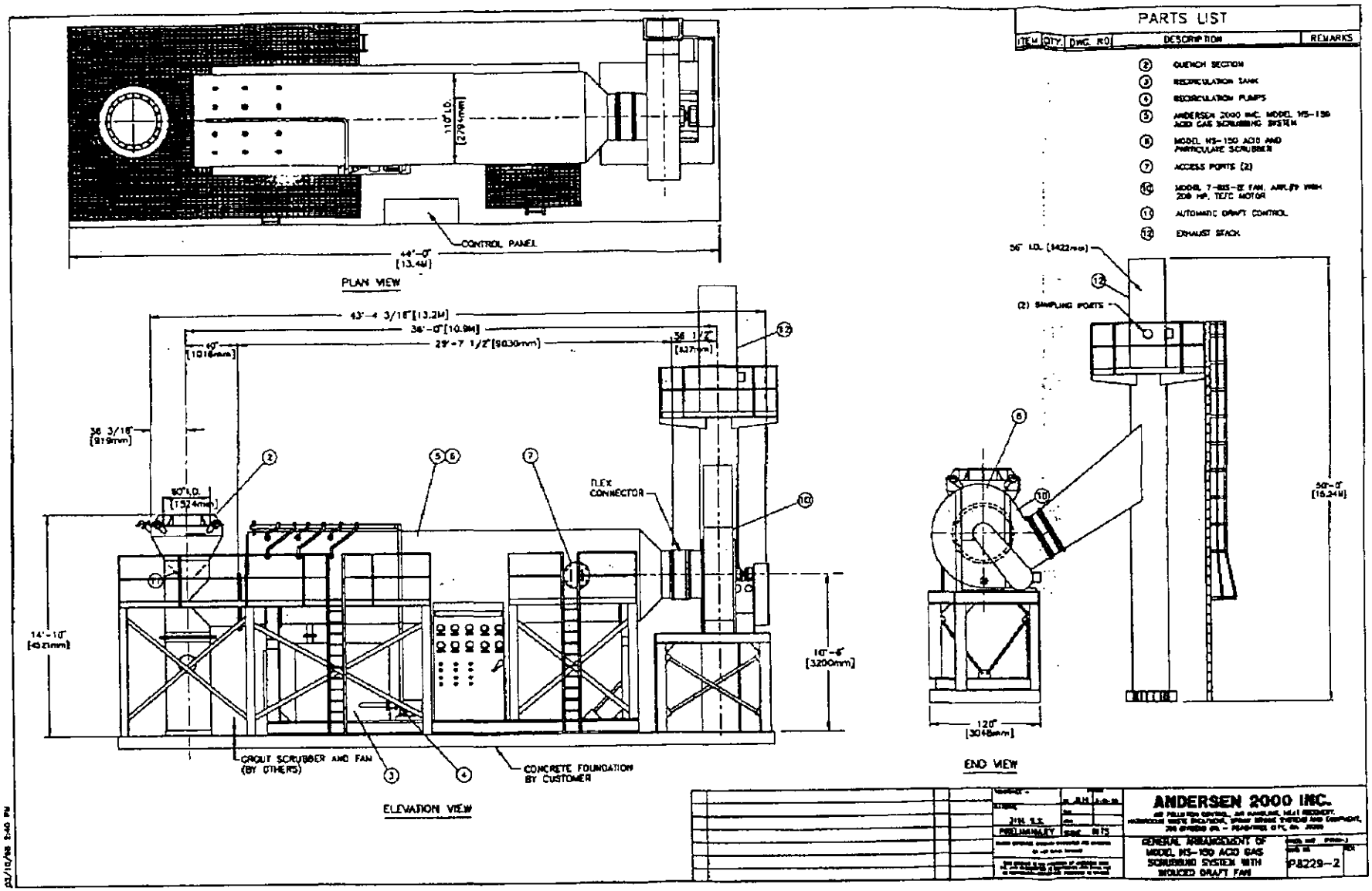
TOTAL PUMP FLOW (METRIC)	8 SODIUM CHEMICAL MAKEUP (ENGLISH)	SODIUM CHEMICAL MAKEUP (METRIC)	9 WATER MAKEUP (ENGLISH)	WATER MAKEUP (METRIC)	10 LIME REACTOR FEED (ENGLISH)	LIME REACTOR FEED (METRIC)	11 LIME REACTANT FEED (ENGLISH)	LIME REACTANT FEED (METRIC)	12 THICKENER FEED LIQUOR (ENGLISH)	THICKENER FEED LIQUOR (METRIC)	13 THICKENER OVERFLOW LIQUOR (ENGLISH)	THICKENER OVERFLOW LIQUOR (METRIC)
620810.06	730.92	331.54	17597.65	7982.12	621541.79	281925.14	.00	.00	822496.44	373058.18	391215.25	266160.33
.00	313.25	142.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	2804.77	1272.22	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	3348.25	1518.75	.00	.00
.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	136.45	88.17	.00	.00
.00	.00	.00	.00	.00	.00	.00	3643.94	1841.93	.00	.00	.00	.00
2082.89	.00	.00	.00	.00	2096.00	950.73	.00	.00	2096.00	950.73	1990.67	902.95
16180.51	.00	.00	.00	.00	16204.56	7350.22	.00	.00	29952.61	13586.20	28447.45	12903.44
11330.78	.00	.00	.00	.00	11367.61	5157.16	.00	.00	.00	.00	.00	.00
7367.77	.00	.00	.00	.00	7609.08	3451.39	.00	.00	7501.36	3402.54	7124.41	3231.56
3666.49	.00	.00	.00	.00	3605.84	1635.57	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.0424	.0192	.0483	.0219
124.56	.00	.00	.00	.00	124.74	56.58	192.84	87.47	317.58	144.06	.00	.00
661344.99	1044.17	473.63	17597.65	7982.12	662529.59	300516.80	3836.78	1740.40	860647.54	303291.86	828777.83	283209.33
824.20	1.61	.36	35.21	8.00	1248.56	283.55	---	---	1263.12	286.86	1187.14	269.60
2.81	30.66	2.11	40.00	2.81	70.00	1.41	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY
1.06	1.30	1.30	1.00	1.00	1.06	1.06	---	---	1.06	1.06	1.06	1.06
67.57	98.00	32.22	70.00	21.11	148.61	64.79	70.00	21.11	153.72	67.63	148.72	64.85
.0188	.0000	.0000	.0000	.0000	.0188	.0188	100.0000	100.0000	.9672	.9672	.0000	.0000
8.1677	30.0000	30.0000	.0000	.0000	8.1677	8.1677	.0000	.0000	8.9149	8.9149	5.9739	5.9739
8.80	>14.00	>14.00	7.00	7.00	8.80	8.80	>14	>14	8.29	8.29	8.29	8.29
---	---	---	---	---	---	---	118.19	3.32	---	---	---	---

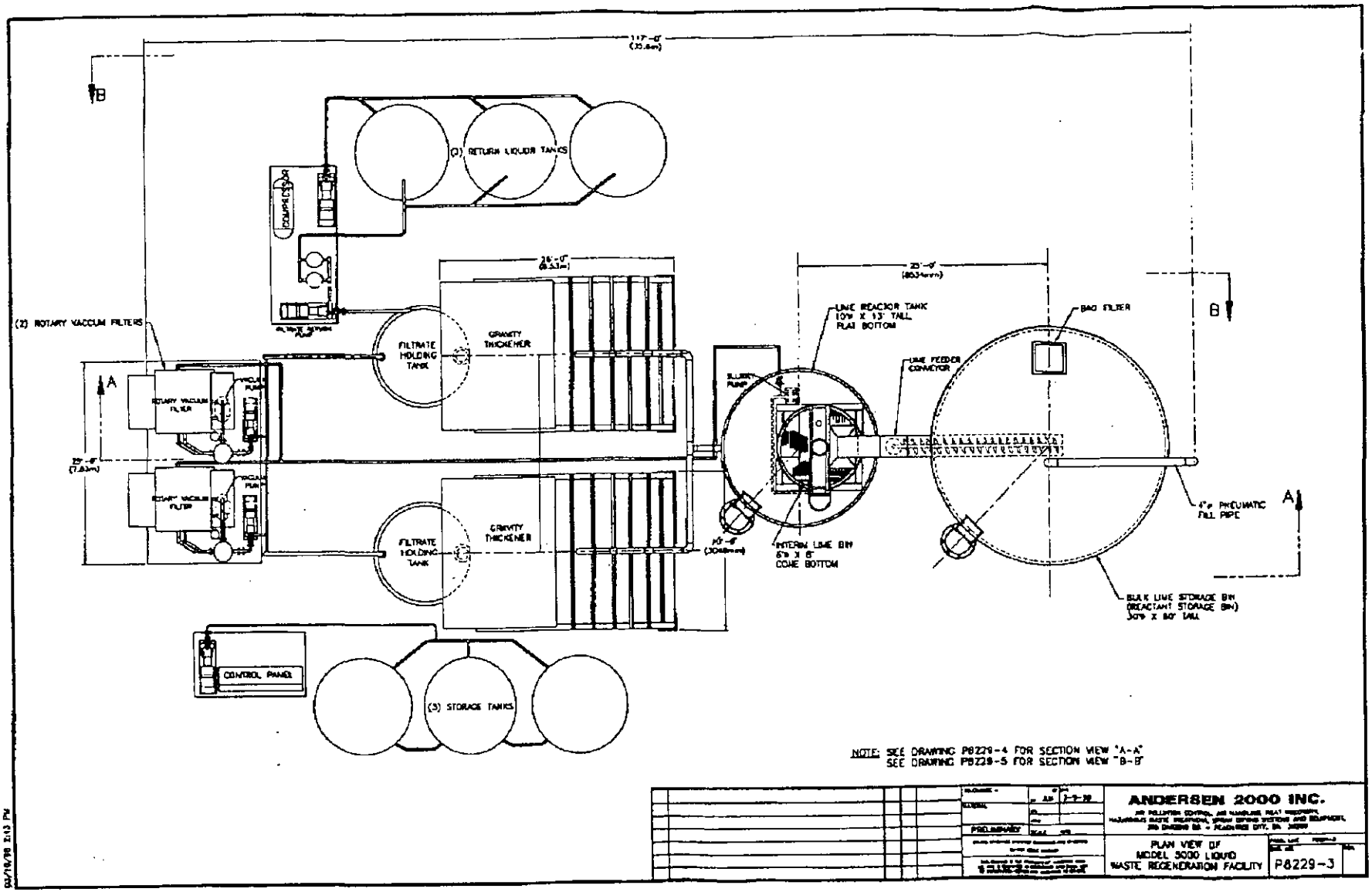
				TOLERA
				MATERIAL
				SEE PROPOSA
				PRELIMINAR
				UNLESS
				THIS



ER #	THICKENER OVERFLOW LIQUOR (METRIC)	14 THICKENER UNDERFLOW SLURRY (ENGLISH)	THICKENER UNDERFLOW SLURRY (METRIC)	15 SOLIDS TO DISPOSAL (ENGLISH)	SOLIDS TO DISPOSAL (METRIC)	16 VACUUM FILTER FILTRATE (ENGLISH)	VACUUM FILTER FILTRATE (METRIC)	17 REGENERATED RETURN LIQUOR (ENGLISH)	REGENERATED RETURN LIQUOR (METRIC)	18 POLISHED RETURN LIQUOR (ENGLISH)	POLISHED RETURN LIQUOR (METRIC)
.28	2861.33	31281.23	14188.45	5958.33	2702.84	25322.90	11486.21	616538.15	279666.54	616538.15	279666.54
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	2804.77	1272.22	2804.77	1272.22	.00	.00	.00	.00	.00	.00
.00	.00	3348.28	1518.75	3348.28	1518.75	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	130.45	59.17	130.45	59.17	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.87	902.95	185.33	47.74	20.06	9.10	85.28	38.68	2075.94	941.63	2075.94	941.63
.48	12903.48	1504.16	682.72	286.70	130.04	1216.46	552.68	29665.91	13456.16	29665.91	13456.16
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.41	3231.56	376.95	170.98	71.80	32.57	305.15	138.41	7429.56	3369.97	7429.56	3369.97
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
483	.0183	.0071	.0018	.0004	.0002	.0017	.0008	.0420	.0191	.0420	.0191
.00	.00	217.58	144.05	317.58	144.06	.00	.00	.00	.00	.00	.00
.83	2852107.22	39660.75	18004.52	12937.97	5868.54	24931.78	12215.99	665709.61	297423.32	665709.61	297423.32
.14	2858.60	75.98	17.28	---	---	80.85	11.56	1237.99	281.15	1237.99	281.15
ITY	GRAVITY	4.30	.30	GRAVITY	GRAVITY	15.00	1.06	40.00	2.81	39.00	1.41
.06	1.06	1.06	1.06	---	---	1.06	1.06	1.06	1.06	1.06	1.06
.72	64.85	148.72	64.85	128.72	53.74	133.72	84.51	148.19	64.51	146.60	63.67
000	.0000	16.5566	16.5566	61.0210	61.0210	.0000	.0000	.0000	.0000	.0000	.0000
739	8.9739	4.9848	4.9848	2.9260	2.9260	5.9739	5.9739	5.9739	5.9739	5.9739	5.9739
.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20	8.20
---	---	---	---	248.81	7.06	---	---	---	---	---	---

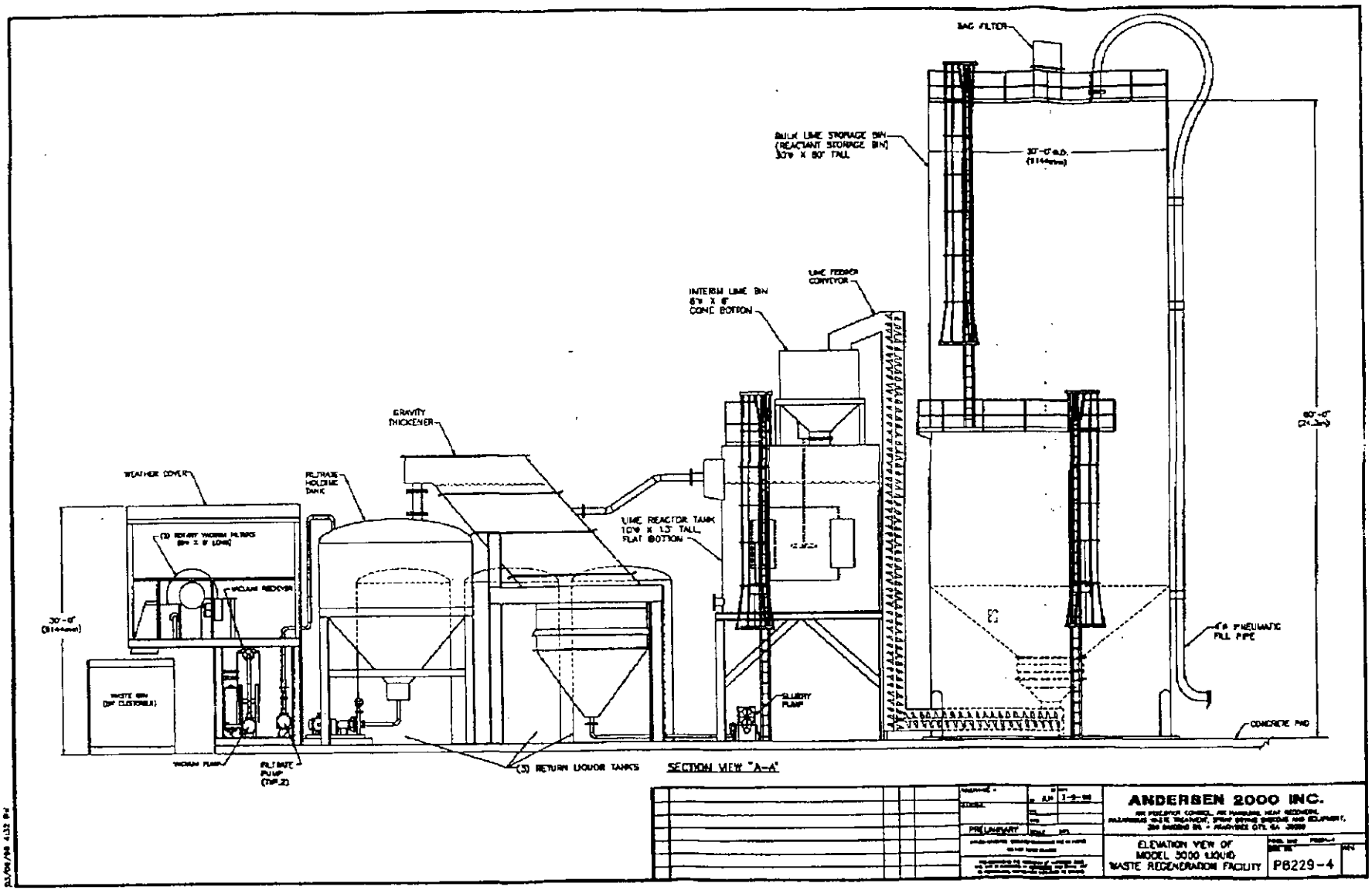
ERANCE = FRU	BY	DATE	**ANDERSEN 2000 INC.**
TERIAL	DR JJH	3-9-98	AIR POLLUTION CONTROL, AIR HANDLING, HEAT RECOVERY, HAZARDOUS WASTE TREATMENT, SPRAY DRYING SYSTEMS AND EQUIPMENT. 306 DIVIDEND DR. – PEACHTREE CITY, GA 30269
EE PROPOSAL	APP'D		
PRELIMINARY	SCALE NTS		PROCESS FLOWSHEET AND MATERIAL BALANCE FOR HF & SO_2 SCRUBBER AND DOUBLE ALKALI REGENERATION SYSTEM FOR PHOSPHATE DEFLUORINATION KILN
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING			PROD. LINE P7695-1A DWG. NO. P8229-1 REV.

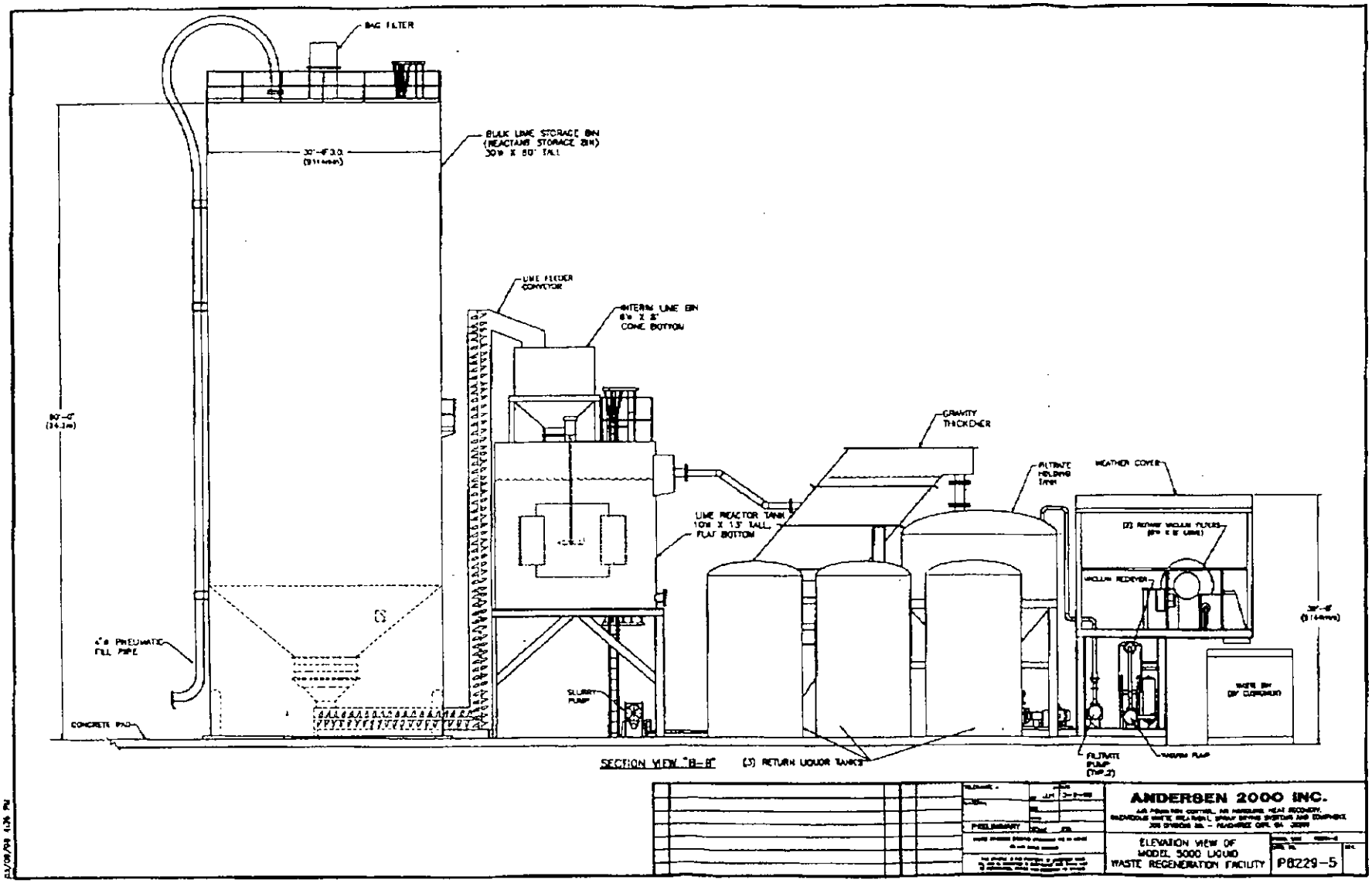

PARTS LIST
ITEM QTY. DWG. NO. DESCRIPTION REMARKS
2 QUENCH SECTION
3 RECIRCULATION TANK
4 RECIRCULATION PUMPS
5 ANDERSEN 2000 INC. MODEL MS-150 ACID GAS SCRUBBING SYSTEM
6 MODEL MS-150 ACID AND PARTICULATE SCRUBBER
7 ACCESS PORTS (2)
10 MODEL 7-825-E FAN, ARR.9 WITH 200 HP, TEFC MOTOR
11 AUTOMATIC DRAFT CONTROL
12 EXHAUST STACK
CONTROL PANEL
44'-0" [13.4M]
PLAN VIEW
43'-4 3/16" [13.2M]
36'-0" [10.9M]
29'-7 1/2" [9030mm]
36 1/2" [927mm]
40" [1016mm]
36 3/16" [919mm]
60" O.D. [1524mm]
FLEX CONNECTOR
14'-10" [4521mm]
10'-6" [3200mm]
GROUT SCRUBBER AND FAN (BY OTHERS)
CONCRETE FOUNDATION BY CUSTOMER
ELEVATION VIEW
56" I.D. [1422mm]
(2) SAMPLING PORTS
50'-0" [15.24M]
120" [3048mm]
END VIEW
PRELIMINARY
ANDERSEN 2000 INC.
GENERAL ARRANGEMENT OF MODEL MS-150 ACID GAS SCRUBBING SYSTEM WITH INDUCED DRAFT FAN
P8229-2



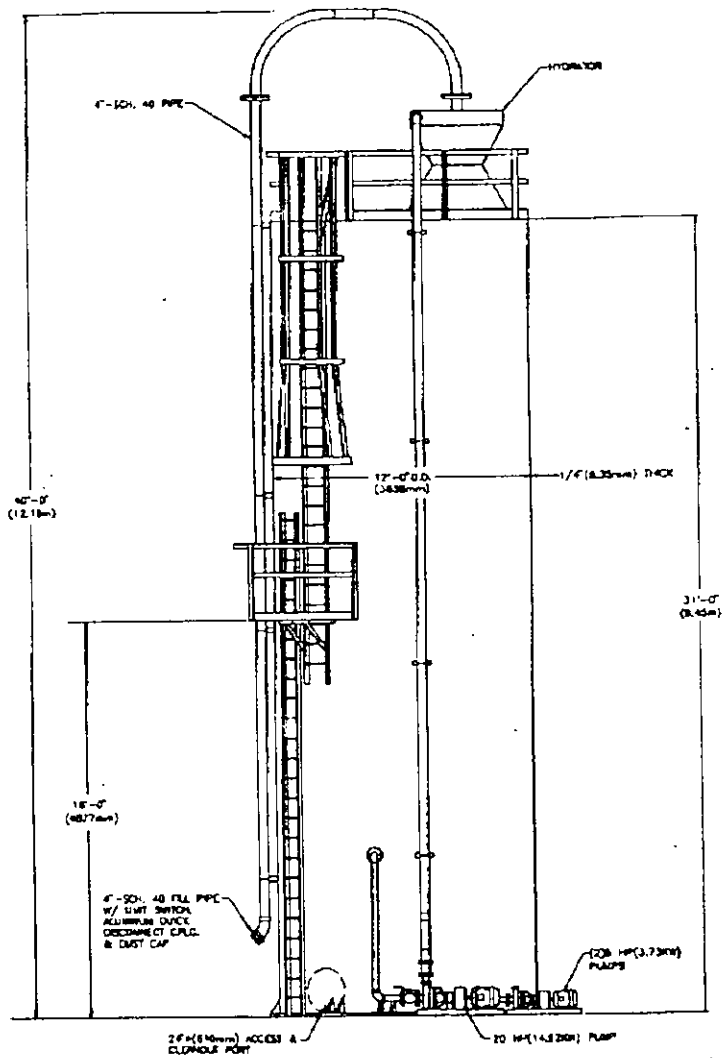
NOTE: SEE DRAWING P8229-4 FOR SECTION VIEW "A-A"
SEE DRAWING P8229-5 FOR SECTION VIEW "B-B"

			ANDERSEN 2000 INC.	
		PRELIMINARY	PLAN VIEW OF MODEL 3000 LIQUID WASTE REGENERATION FACILITY	P8229-3

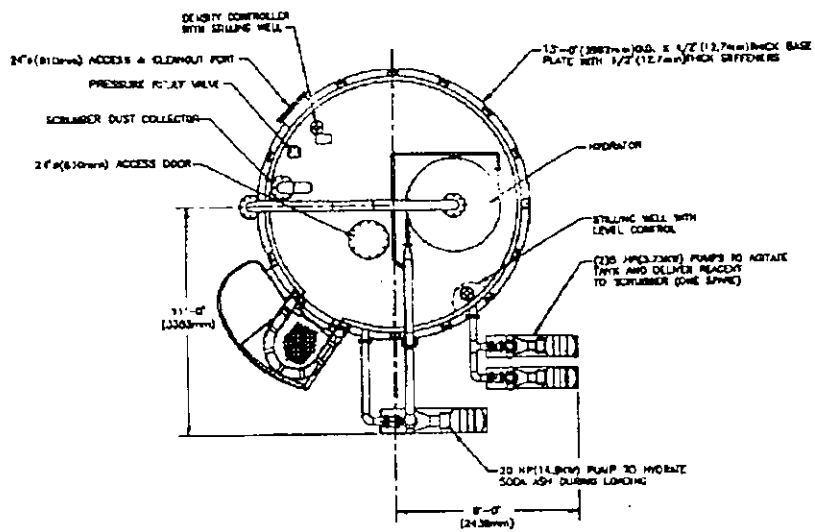

BAG FILTER
BULK LIME STORAGE BIN (REACTANT STORAGE BIN) 30'ø X 60' TALL
30'-0" O.D.
LIME FEEDER CONVEYOR
INTERIM LIME BIN 6'ø X 6' CONE BOTTOM
GRAVITY THICKENER
WEATHER COVER
FILTRATE HOLDING TANK
LIME REACTOR TANK 10'ø X 13' TALL FLAT BOTTOM
(3) REVERT VACUUM FILTERS
VACUUM RECEIVER
30'-0"
4'ø PNEUMATIC FILL PIPE
SLURRY PUMP
CONCRETE PAD
VACUUM PUMP
FILTRATE PUMP (TYP.2)
(3) RETURN LIQUOR TANKS
SECTION VIEW "A-A"
PRELIMINARY
ANDERSEN 2000 INC.
ELEVATION VIEW OF MODEL 3000 LIQUID WASTE REGENERATION FACILITY
P8229-4


BAG FILTER
BULK LIME STORAGE BIN
(REACTANT STORAGE BIN)
30'W X 80' TALL
LIME FEEDER CONVEYOR
INTERIM LIME BIN
8'W X 8'
CONE BOTTOM
GRAVITY THICKENER
FILTRATE HOLDING TANK
WEATHER COVER
LIME REACTOR TANK
10'W X 13' TALL
FLAT BOTTOM
VACUUM RECEIVER
4" Ø PNEUMATIC FILL PIPE
SLURRY PUMP
CONCRETE PAD
FILTRATE PUMP (TYP.2)
SECTION VIEW "B-B"
(3) RETURN LIQUOR TANKS
ANDERSEN 2000 INC.
ELEVATION VIEW OF
MODEL 5000 LIQUID
WASTE REGENERATION FACILITY
P8229-5
PRELIMINARY

PARTS LIST				
ITEM	QTY.	DWG. NO.	DESCRIPTION	REMARKS

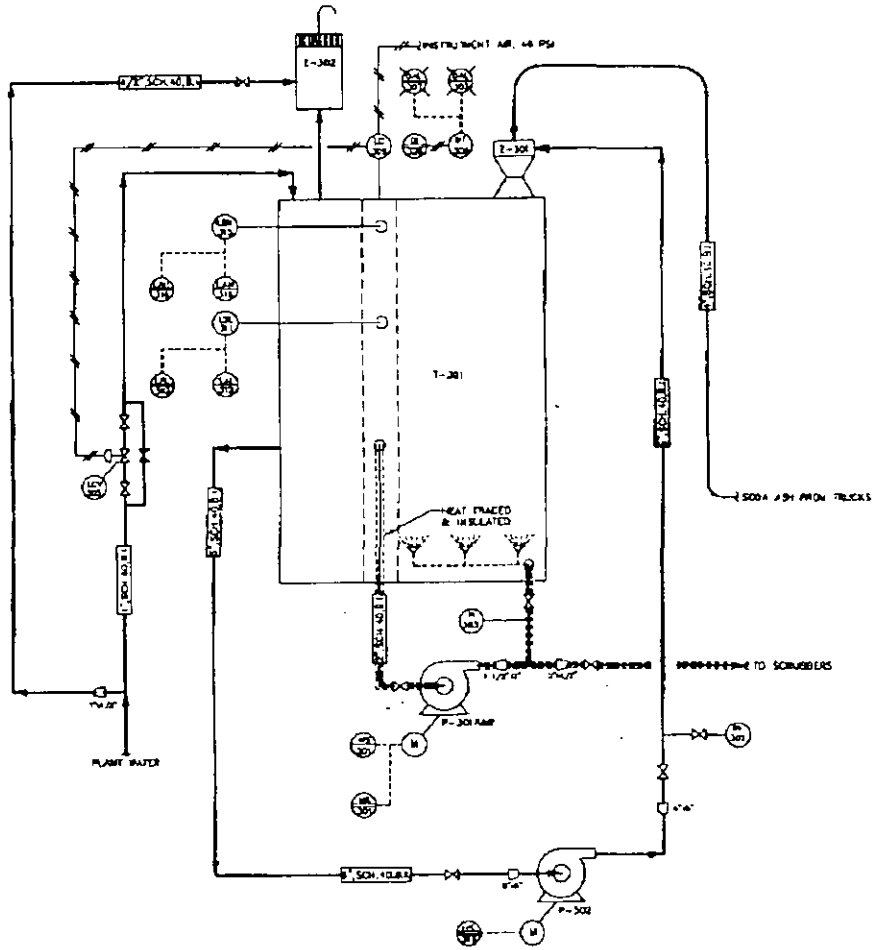


ELEVATION VIEW



PLAN VIEW

SEE PROPOSAL		ANDERSEN 2000 INC.	
PRELIMINARY		MODEL 21000 SODA ASH SLURRY STORAGE	PB229-6



P-301AMR RECIRCULATION AND CAUSTIC FEED PUMP
OPR: 30 PSIG: 40
SP GR: 1.2 HP: 5
RPM: 1750
SEAL: MECHANICAL SEAL WITHOUT SEAL FLUSH
MATERIALS OF CONSTRUCTION: CAST IRON AND STEEL

P-302 SODA ASH LOADING PUMP
OPR: 300 PSIG: 20
SP. GR.: 1.55 HP: 20
RPM: 1750
SEAL: MECHANICAL SEAL WITHOUT SEAL FLUSH
MATERIALS OF CONSTRUCTION: CAST IRON AND STEEL
NOTE, PUMP OPERATES ONLY DURING LOADING OPERATION.

T-301 SODA ASH STORAGE TANK
TOTAL CAPACITY: 24,000 GAL.
OPERATING CAPACITY: 21,000 GAL.
DIAMETER: 12'-8" ST WALL: 3/16"
TOP: X CLOSED ____ OPEN
MATERIALS OF CONSTRUCTION: 1/4" MILD STEEL

LEGEND

- FIELD INSTRUMENT
- SCRUBBER PANEL
- SODA ASH PANEL
- PIPE
- HEAT TRACED PIPE
- AIR LINE
- ELECTRICAL
- B.I. BLACK IRON
- S.S. STAINLESS STEEL

AS NOTED		
PRELIMINARY		

ANDERSEN 2000 INC.

PIPING AND INSTRUMENTATION DIAGRAM FOR SODA ASH TANK

PB229-7

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 124-97-03

April 23, 1998

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Reynolds:

This is a follow up to your telephone conversation today with Pradeep Raval regarding a revision of the emissions estimates for nitrogen oxides (NOx) from the proposed Multifos kiln.

IMC-Agrico has no NOx emissions data for the existing Multifos kilns. However, there is information on a similar, natural gas fired, kiln at Coronet which calcines phosphate rock into animal feed supplement.

No. 2 fuel oil is requested as a secondary/emergency fuel. As there is no available test data for fuel oil fired conditions for this type of kiln, an AP-42 NOx emission factor for a lightweight aggregate kiln has been used to estimate NOx emissions during fuel oil firing. The updated NOx emissions estimates are presented in Attachment 1.

If you have any further questions, please do not hesitate to call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

cc: File
Polk Co.
SWD
EPA
NPS

JBK:par
encl.

c: C. Dave Turley, IMC-Agrico

ATTACHMENT 1

UPDATED EMISSIONS ESTIMATES FOR NITROGEN OXIDES

NOx emissions during natural gas fired conditions are estimated based on information from a similar process kiln at Coronet:

NOx Emissions = 2.17 lb/hr, at 28 MMBtu/hr and 8.5 tph feed.

Emiss. Factor = 2.17 lb/hr / 8.5 tph feed = 0.255 lb NOx/ton feed

Based on this emissions factor, the proposed Multifos kiln emissions can be estimated as follows:

Feed Rate = 6.5 tph P2O5 or 17.1 tph feed

NOx Emissions = 17.1 tph feed x 0.255 lb NOx/ton feed
= 4.4 lb/hr
X 8760 hrs/yr x ton/2000 lbs
= 19.1 tpy on natural gas

NOx emissions from No. 2 fuel oil firing can be back calculated to avoid PSD applicability for NOx, using NOx emission factor of 1.9 pound per ton feed for lightweight aggregate kiln with scrubber (AP-42, Table 11.20-4). This factor is used as a conservative estimate for the purpose of initial permitting. It is requested that the allowable operating hours on No. 2 fuel oil be refined based on compliance test results.

NOx Emiss. Cap = 39 tpy - 19.1 tpy = 19.9 tpy on No. 2 fuel oil

NOx Emissions = 1.9 lb/ton feed x 17.1 tph feed
= 32.5 lb/hr

Operating Hrs. = 19.9 tpy x 2000 lbs/ton / 32.5 lb/hr
= 1225 hrs/yr on No. 2 fuel oil

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 124-97-03

April 23, 1998

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Reynolds:

This is a follow up to our letter dated April 15, 1998, regarding the updated scrubber performance guarantee from the manufacturer for sulfur dioxide emissions control. Please find enclosed a letter from the manufacturer with a scrubber control efficiency of 97 percent for sulfur dioxide. Also enclosed is the summary of the sulfur dioxide emissions measurements recently conducted.

If you have any questions, please call me.

Very truly yours,

KOOGLER & ASSOCIATES

Pradeep Raval

par
encl.

c: C. Dave Turley, IMC-Agrico

CC: File
Polk Co.
SWD
EPA
NPS

D.R. TECHNOLOGY, INCORPORATED
POLLUTION CONTROL & ENERGY CONSERVATION
CONSULTING • DESIGN • ENGINEERING
78 SOUTH STREET, FREEHOLD, NEW JERSEY 07728
TELEPHONE (908) 780-4664

April 20, 1998

IMC-Agrico, Inc.
P. O. Box 2000
Mulberry, Florida 33800-1100

Attn: Mr. Richard Harrison (P:941-428-2500 x6570/F:7191)

Subject: Final Data For SO_2 Absorber On Your Phosphate Rock Defluorinator
D. R. Technology Reference: 771 (formerly B723)

Dear Mr. Harrison:

This letter is intended to summarize all the changes and items we discussed.

A summary is as follows:

1) Gas flow is still 25,000 ACFM at 100°F with 200 lbs./hr. SO_2 maximum.

2) Vessel design pressure to drop to minus 45 inch water gage.

3) SO_2 removal efficiency goes to 97% from 96%. We will increase packed bed depth to 12'-0" fro 10'-0" to achieve this.

4) Gas inlet nozzle changes from 1'-6" high x 4'-6" wide to 3'-9" high by 1'-8" wide, thereby increasing tower height by 2'-3".

5) Metering pump motor control to change from SCR-DC to VFD-AC.

6) Fresh water addition to be done via automatic flow control (flow meter, flow control valve, controller). Moore products supply. Controller to be installed in IMC panel. Pricing breakout provided.

7) A Rosemount 2" magflow meter tube and transmitter will be installed on the recycle flow (0-250 GPM), 4-20 mA signal to customer panel.

8) The level switches will be removed in favor of a Rosemount diaphragm level transmitter generating a 4-20mA signal. Level set points can be done off this.

9) Blowdown, valve will switch to a CPVC 1" ball valve with pneumatic actuator.

10) Motors to be GE, Reliance, or USA equal.

Attn: Mr. Richard Harrison (P:941-428-2500 x6570/F:7191)

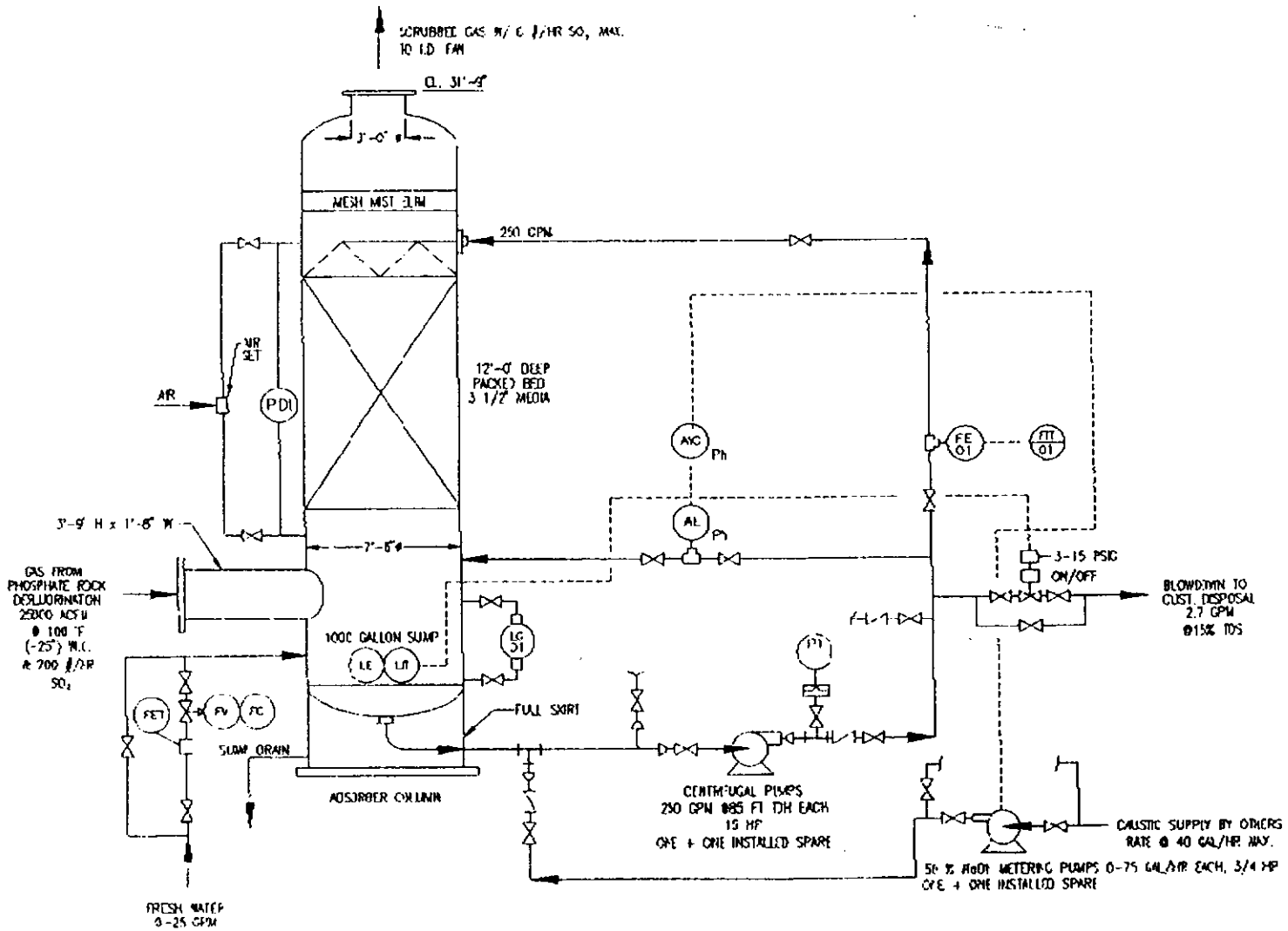
Please feel free to call the undersigned, or Mr. Hernandez with questions you may have.

Very truly yours,
D. R. TECHNOLOGY, INC.

Richard A. Schwartz,
President

RAS:dk
cc: H & B Industrial Equipment Co.
P. O. Box 6246
4406 S. Florida Ave.
Lakeland, Florida 33807-6246
Attn: Luis Hernandez
P:941-647-5943/F:0018

B:771P4208



NOTES:

1. ALL PIPE & FITTINGS ARE 2PVC, SCHED 80 SOCKET WELD ENDS, EXCEPT CAUSTIC PIPE IS C.S.
2. SYSTEM BASIS: 97 % SO2 REDUCTION.
3. NO PANEL IS PROVIDED. ALL INDICATORS ARE INSTALLED IN INC PANEL.

D.R. TECHNOLOGY INC

73 SOUTH STREET FREEHOLD, N.J. 07728

PFB/F&III

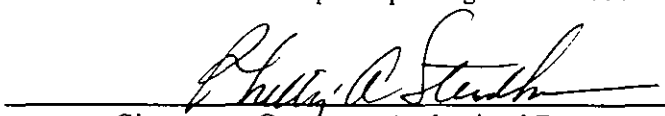
MAUMONT, FLORIDA

Report of Emissions Sampling

IMC-Agrico Company

Project: Multifos Production Plant
Facility: New Wales Operations
Point ID: 36
AIRS: 1050059
Permit Number: AO53-206083B
Test Date:April 9, 1998

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Protection requirements and all test data and plant operating data are true and correct.



Signature, Owner or Authorized Representative
P. A. Steadham, Chief Environmental Services - Concentrates

IMC-Agrico Company
P.O. Box 2000
Mulberry, FL 33860

(941) 428-2500

Company ID #: 1100

Introduction:

This report details the preformance testing results for the following source:

Project: Multifos Production Plant
Facility: New Wales Operations
Point ID: 36
AIRS: 1050059
Permit Number: AO53-206083B
Test Date:April 9, 1998

Summary of Results

The process data and emissions testing results are summarized below:

Process Data:

Kilns P2O5 Feed Rate	8.24 TPH
Wet Rock Dryer Feed Rate	28.3 TPH

Fuel Firing Information

Fuel: Natural Gas

Oil Firing since Last Test: NO

Dryer Fuel Rate	3.67 MMBtu/hr
A Kiln Fuel Rate	47.7 MMBtu/hr
B Kiln Fuel Rate	48.3 MMBtu/hr

Emissions:

Sulfur Dioxide:	lb/hr	376

Emissions Testing Methods:

Sulfur Dioxide: Method 6 using Method 8 analysis and solutions.

Test Participants

Conducted the Field Testing

1 M. Lennard

2 R. Sellers

Performed the Laboratory Analysis

1 D. Averitt

Provided the Process Data

1 P. Green

Prepared the Test Report

1 M. Lennard

Source Sampling Summary Sheet

Facility:	New Wales
Plant:	Multifos Plant
Company ID:	1100
FDEP AIRS & Pt. ID:	1050059 & 36
Test Team:	ML / RS

Parameter	Unit	Run 1	Run 2	Run 3	Average
Date:		4/9/98	4/9/98	4/9/98	
Time Start:		820	1015	1140	
Time End:		940	1115	1245	
Barometric Pressure:	Inch Hg	30.05	30.05	30.05	
Static Pressure:	Inch H2O	0.69	0.69	0.69	
Stack Pressure:	Inch Hg	30.101	30.101	30.101	
Average Sqrt Delta P:	Inch HOH 1/2	1.069	1.071	1.079	
Average Delta H:	Inch HOH	1.150	1.158	1.167	1.158
Maximum Run Vacuum:	Inch Hg	3.0	4.0	4.0	4.0
Meter Box Number:	Unity	3188	3188	3188	
Average Meter Temp:	Degrees F	79.1	82.6	80.4	
Average Stack Temp:	Degrees F	98.2	100.8	100.9	100.0
Metered Sample Volume:	Cubic Feet	37.92	37.76	38.02	
Standard Meter Volume:	Cubic Feet	38.04	37.64	38.05	
Moisture Measured:	%	0.0508	0.0604	0.0549	
Moisture Saturation:	%	0.0608	0.0659	0.0660	
Moisture Used for Calculations:	%	0.0508	0.0604	0.0549	0.0554
Pitot Coefficient:	Unity	0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.186	0.186	0.186	
Stack Area:	Square Feet	15.90	15.90	15.90	
Traverse Points:	Unity	12	12	12	
Sampling Time:	Minutes	60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	28.412	28.306	28.367	
Actual Stack Velocity:	Feet/sec	62.046	62.385	62.787	62.406
Actual Stack Gas Flow:	ACFM	59178	59501	59885	59521
Dry Standard Stack Gas Flow:	DSCFM	53456	52949	53598	53335
Isokinetic Rate:	%	100.01	99.90	99.76	
SO2 Emission:	lb/day	8842	8888	9360	9030
SO2 Emission:	lb/hr	368	370	390	376

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 ▪ FAX/377-7158

KA 124-97-03

April 15, 1998

RECEIVED
APR 20 1998
BUREAU OF
AIR REGULATION

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Reynolds:

This is a follow up to your telephone conversation with Pradeep Raval on April 7, regarding the revision of the emissions estimates for sulfur dioxide from the proposed Multifos kiln.

On April 9, IMC-Agrico conducted additional measurements of sulfur dioxide emissions from the existing Multifos Plant. The sulfur dioxide emissions were measured, using EPA Method 8, at 376 pounds per hour. A summary of the emissions measurements is presented in Attachment 1.

IMC-Agrico is willing to accept federally enforceable permit conditions, on the annual material processing rate, in order to avoid PSD applicability for sulfur dioxide. The emissions calculations for the proposed kiln, presented in Attachment 2, are based on the recent emissions data and an updated scrubber performance guarantee. A letter from the scrubber manufacturer will be sent under separate cover.

IMC-Agrico will conduct the initial compliance tests on the proposed kiln at three operating levels of 50, 75 and 100 percent of the permitted hourly rate. These levels reflect the expected operating range of the new kiln during the course of a year. While operating in compliance with the sulfur dioxide emissions limit, a relationship will be established between the caustic feed rate to the scrubber and the kiln operation rate. During subsequent operations, the caustic feed rate to the scrubber will be kept within the compliant levels established during the compliance tests for the corresponding kiln operating level. This method of operation will ensure, for instance, that the caustic feed rate to the scrubber does not correspond to the maximum permitted kiln operation rate when the kiln is actually operating at 50 percent of the permitted rate.

It is expected, based on past FDEP permitting procedure, that appropriate caustic feed rate limit(s) will be incorporated into the Title V operation permit and the necessary recordkeeping will be required. Consequently, the condition will be federally enforceable.

It is our understanding that FDEP will be able to conclude the technical review of the proposed project with the enclosed information.

If you have any further questions, please do not hesitate to call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: C. Dave Turley, IMC-Agrico

CC: File
Polk Co
SWD
EPA
NPS

ATTACHMENT 1

SULFUR DIOXIDE EMISSIONS MEASUREMENTS
FROM MULTIFOS PLANT

Source Sampling Summary Sheet

Facility:	New Wales
Plant:	Multifos Plant
Company ID:	1100
FDEP AIRS & Pt. ID:	1050059 & 36
Test Team:	ML / RS

Parameter	Unit	Run 1	Run 2	Run 3	Average
Date:		4/9/98	4/9/98	4/9/98	
Time Start:		820	1015	1140	
Time End:		940	1115	1245	
Barometric Pressure:	Inch Hg	30.05	30.05	30.05	
Static Pressure:	Inch H2O	0.69	0.69	0.69	
Stack Pressure:	Inch Hg	30.101	30.101	30.101	
Average Sqrt Delta P:	Inch HOH 1/2	1.069	1.071	1.079	
Average Delta H:	Inch HOH	1.150	1.158	1.167	1.158
Maximum Run Vacuum:	Inch Hg	3.0	4.0	4.0	4.0
Meter Box Number:	Unity	3188	3188	3188	
Average Meter Temp:	Degrees F	79.1	82.6	80.4	
Average Stack Temp:	Degrees F	98.2	100.8	100.9	100.0
Metered Sample Volume:	Cubic Feet	37.92	37.76	38.02	
Standard Meter Volume:	Cubic Feet	38.04	37.64	38.05	
Moisture Measured:	%	0.0508	0.0604	0.0549	
Moisture Saturation:	%	0.0608	0.0659	0.0660	
Moisture Used for Calculations:	%	0.0508	0.0604	0.0549	0.0554
Pitot Coefficient:	Unity	0.84	0.84	0.84	
Nozzle Diameter:	Inch	0.186	0.186	0.186	
Stack Area:	Square Feet	15.90	15.90	15.90	
Traverse Points:	Unity	12	12	12	
Sampling Time:	Minutes	60	60	60	
Stack Gas Molecular Weight:	lb/lb-mol	28.412	28.306	28.367	
Actual Stack Velocity:	Feet/sec	62.046	62.385	62.787	62.406
Actual Stack Gas Flow:	ACFM	59178	59501	59885	59521
Dry Standard Stack Gas Flow:	DSCFM	53456	52949	53598	53335
Isokinetic Rate:	%	100.01	99.90	99.76	
SO2 Emission:	lb/day	8842.39	8887.95	9360.45	9030.26
SO2 Emission:	lb/hr	368.43	370.33	390.02	376.26

Production Information:		tph	moisture	P content	P2O5 tph
Kiln A tph		12.5	0.0542	0.1618	4.38
Kiln B tph		11.0	0.0510	0.1611	3.85
				total tph P2O5	8.23
				lb OSO/ton P2O5	45.7

ATTACHMENT 2

SULFUR DIOXIDE EMISSIONS ESTIMATES

IMC-Agrico proposes to limit the annual material input rates in order to avoid PSD review for sulfur dioxide emissions.

SULFUR DIOXIDE EMISSIONS

In order to avoid PSD review for SO2, the annual emissions have to be less than the PSD significant level of 40 tpy.

Annual SO2 Cap	=	39 tpy
Scrubber Eff.	=	97 percent
SO2 to Scrubber	=	39 tpy/(1-0.97) x 2000 lbs/ton x yr/8760 hrs
	=	296.8 lbs/hr
Material Input	=	296.8 lbs/hr / 376 lbs/hr (test) x 8.23 tph P205
	=	6.5 tph P205 feed, annual average
		x 8760 hrs/yr
	=	56,910 tpy P205 feed

Please accept the corrected annual material input cap as an amendment to the permit application under FDEP review. A maximum hourly feed rate of 7.2 tph P205 (within 10 percent of the annual average), is requested in order to accommodate fluctuations in normal operations. IMC-Agrico will retain records to demonstrate compliance with the limits.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 124-97-03

April 3, 1998

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Reynolds:

This is in response to your telephone conversation yesterday with Pradeep Raval regarding the above referenced project.

Enclosed is a waiver of the 30-day review period, to allow IMC-Agrico time to submit additional information on the potential sulfur dioxide emissions from the proposed project.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: C. Dave Turley, IMC-Agrico

CC: File
polk CO.
EPA
NPS
SWD

WAIVER OF 30 DAY TIME LIMIT
UNDER SECTIONS 120.60(1) AND 403.0876, FLORIDA STATUTES

License (Permit) Application No.: 1050059-024-AC, PSD-FL-244

Applicant's Name: IMC-Agrico Company (New Wales)

Project: Multifos Plant Production Increase

With regard to the above referenced application, the applicant hereby with full knowledge and understanding of applicant's rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right to have the application reviewed for completeness by the State of Florida Department of Environmental Protection within the 30 day time period prescribed by law. Said waiver is made freely and voluntarily by the applicant, with full knowledge, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Protection.

This waiver shall expire on the 15th day of May, 1998.

The undersigned is authorized to make this waiver on behalf of the applicant.

Signature

John B. Koogler, Ph.D., P.E.
Name

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

PROJECT 124-97-03

FAX TRANSMITTAL FORM

TO: John Reynolds
FDEP Tallahassee

FAX NO.

FROM: Pradeep Raval

DATE: 4/6/98 SENT BY: PR

The text being transmitted consist s of 2 page(s) PLUS this one. If you do not receive all of the pages or if there are difficulties with this transmission, please call (352) 377-5822.

REMARKS: Sorry about the delay in faxing this off. Hope everything else is going well.

Regards,
PR

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 124-97-03

April 3, 1998

Mr. John Reynolds
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Reynolds:

This is in response to your telephone conversation yesterday with Pradeep Raval regarding the above referenced project.

Enclosed is a waiver of the 30-day review period, to allow IMC-Agrico time to submit additional information on the potential sulfur dioxide emissions from the proposed project.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
encl.

c: C. Dave Turley, IMC-Agrico

WAIVER OF 30 DAY TIME LIMIT
UNDER SECTIONS 120.60(1) AND 403.0876, FLORIDA STATUTES

License (Permit) Application No.: 1050059-024-AC, PSD-FL-244

Applicant's Name: IMC-Agrico Company (New Wales)

Project: Multifos Plant Production Increase

With regard to the above referenced application, the applicant hereby with full knowledge and understanding of applicant's rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right to have the application reviewed for completeness by the State of Florida Department of Environmental Protection within the 30 day time period prescribed by law. Said waiver is made freely and voluntarily by the applicant, with full knowledge, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Protection.

This waiver shall expire on the 15th day of May, 1998.

The undersigned is authorized to make this waiver on behalf of the applicant.

Signature

John B. Koogler, Ph.D., P.E.
Name

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 124-97-03

March 5, 1998

Mr. A. A. Linero
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: IMC-Agrico Company (New Wales)
Multifos Plant Production Increase
DEP File No. 1050059-024-AC, PSD-FL-244

Dear Mr. Linero:

This is in response to your letter dated December 16, 1997, requesting additional information on the above referenced project. The responses are in the order of the questions raised by FDEP and the U.S. Fish & Wildlife Service (FWS).

1. **A detailed description of the proposed emission control system is needed including control system flow rates (gas and liquid streams), pond water fluoride concentrations and temperatures, and the proposed SO_2 removal efficiency and cost effectiveness calculations. The additional information should be sufficiently detailed to allow a determination of achievable emission levels through mass transfer calculations. A thorough assessment of the cost effectiveness of the various SO_2 control options including a separate countercurrent scrubber vs. the proposed crossflow add-on should be done.**

RESPONSE:

The proposed scrubber system arrangement has been revised after further discussions with the equipment manufacturer. IMC-Agrico proposes to include a counter-current scrubber, with a manufacturer guaranteed SO2 control efficiency of 95 percent. Based on this level of control, the net SO2 emissions increase from the proposed project will be less than significant. Therefore, the proposed project is no longer subject to PSD applicability for SO2 (see attached calculations). Accordingly, please disregard the previously submitted information on BACT and air impact analysis for SO2. The available information on the proposed scrubber system is presented in Attachment 1.

2. **Please explain why the SO_2 scrubbing system performance was not specified. SO_2 scrubbing is sufficiently advanced that the reagent and its performance can be specified prior to construction. Also explain the sulfurous acid/stripper system indicated on Drawing L5.**

RESPONSE:

Details of the SO2 scrubber are provided in Attachment 1. The scrubber performance information from the manufacturer is also included. Please note that the proposed project no longer includes a stripper. A revised drawing is included in Attachment 1.

3. **Along with the Appendix D information to be submitted, please provide all SO_2 emission test results that have been obtained for this plant to date.**

RESPONSE:

Only a single test has been conducted to determine the SO2 emissions from the existing plant. Results of that test are presented in Attachment 2. Appendix D information is presented in Attachment 1.

4. **NOx emissions based on AP-42 factors exceed the PSD significance level when No. 6 oil is used for 400 hours (Kiln: 4.1 TPY for No. 6; 33.4 TPY for No. 2; Dryer: 0.3 TPY for No. 6; 2.5 TPY for No. 2 = 40.3 TPY total). To resolve PSD-applicability concerns, EPA Method 7E emission tests should be performed while burning each of the fuels used and the results submitted along with Appendix D.**

RESPONSE:

In response to FDEP's concerns regarding NOx, IMC-Agrico will maintain an annual usage cap on No. 6 fuel oil (back-up fuel), in order to avoid NOx PSD applicability. The emissions estimates are based on AP-42 factors which have been similarly relied upon by FDEP for numerous projects. Updated NOx emissions estimates are presented in Attachment 3. Although not typically required by FDEP for other synthetically limited sources, IMC-Agrico can conduct initial performance tests for NOx to provide reasonable assurance on the reliance on AP-42 factors for synthetic limitation.

5. **FWS question on the net emissions increases from the facility: For example, will there be a net increase in the phosphoric acid production, or other plants, as a result of the proposed project?**

RESPONSE:

As addressed in the application, no increase in phosphoric acid production is required for the proposed project. Some of the excess phosphoric acid normally shipped offsite will be supplied to the third kiln. As a result, the other chemical plants will be unaffected by the proposed project.

6. **FWS comparison of fluoride control efficiencies between the proposed project and Farmland's fertilizer plant.**

RESPONSE:

The FWS is suggesting that IMC-Agrico's scrubber for the proposed project meet the level of fluoride control that was proposed by Farmland for the fertilizer plant in 1992. Several dissimilarities between the plants, which affect the evaluation of control technology, should be noted.

The two plants being compared manufacture totally different products. Farmland's unit produces fertilizer while IMC-Agrico's unit produces animal feed ingredients. The control of potential emissions, in the case of the Farmland project, is based on the use of a series of scrubbers to recover process materials. Farmland proposed a 99 percent "system removal efficiency" based on fluorides going in to the plant and the fluorides going out of the stack. Also, it should be noted that the regulatory requirements pertaining to allowable fluoride emissions are dramatically different for the two plants. Under FDEP rules, the respective applicable fluorides emissions limits for a DAP plant and the proposed project are 0.06 lb/ton P2O5 and 0.37 lb/ton P2O5.

7. **FWS statement that the proposed project will not significantly affect the air quality or the air quality related values at Chassahowitzka Wilderness.**

RESPONSE:

We concur with the above FWS conclusion regarding the proposed project.

ADDITIONAL ISSUES

A. IMC-Agrico proposes caustic as an alternate raw material to soda ash. This would allow flexibility in the operation of the plant to adjust to prevailing materials market and availability. It is expected that the use of liquid caustic will result in a decrease in particulate matter emissions over the current handling of soda ash (powder).

B. Based on past visible emissions data for the Multifos plant stack, IMC-Agrico requests FDEP to include a permit limit for PM emissions without a limit on visible emissions. Please see the correspondence presented in Attachment 4. If necessary, IMC-Agrico is willing to conduct additional concurrent PM and VE testing upon completion of construction. A test protocol can be worked out to the satisfaction of FDEP.

If you have any questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

Steven C. Cullen, P.E.

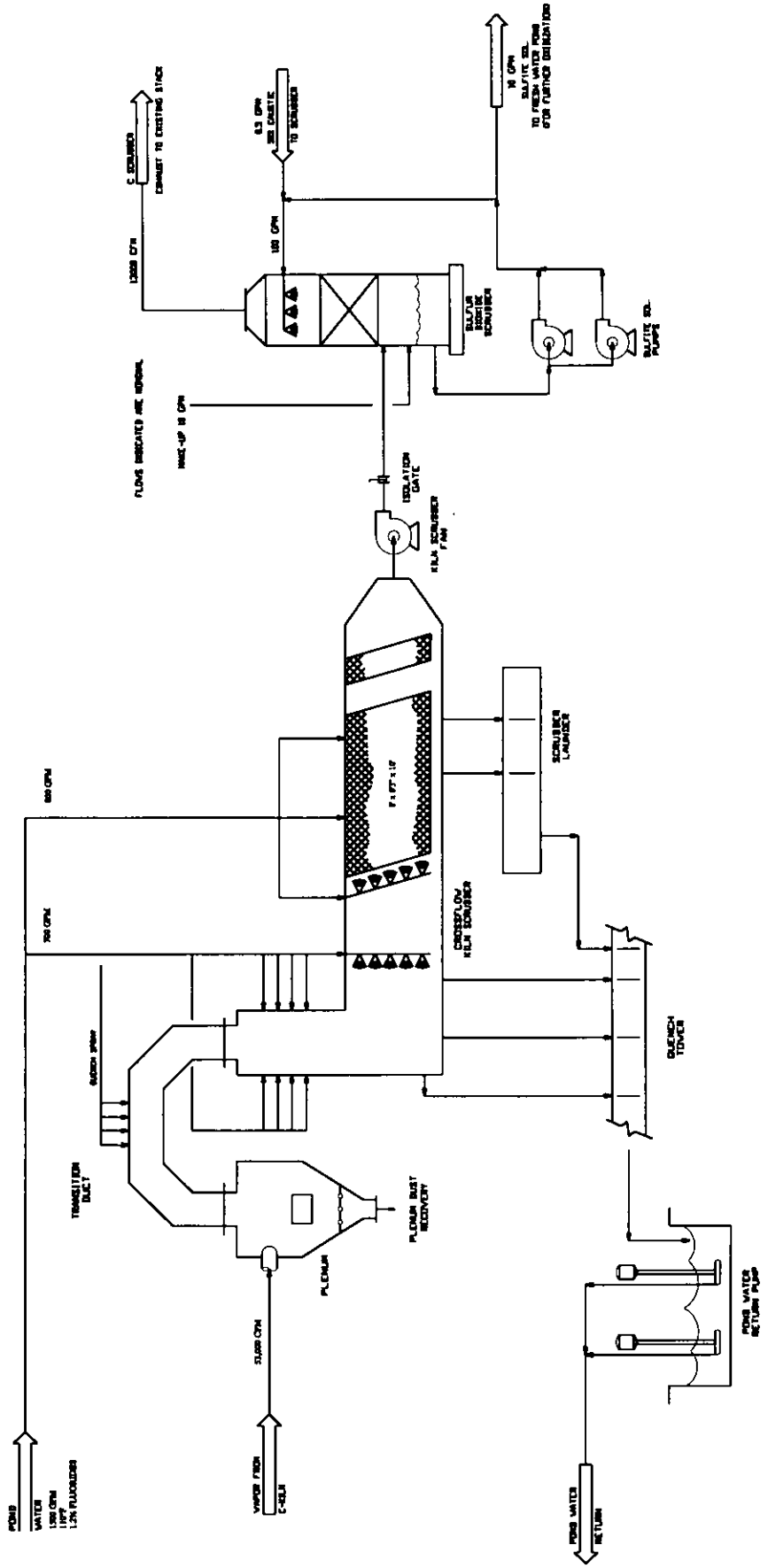
SCC:par
encl.

c: C. Dave Turley, IMC-Agrico

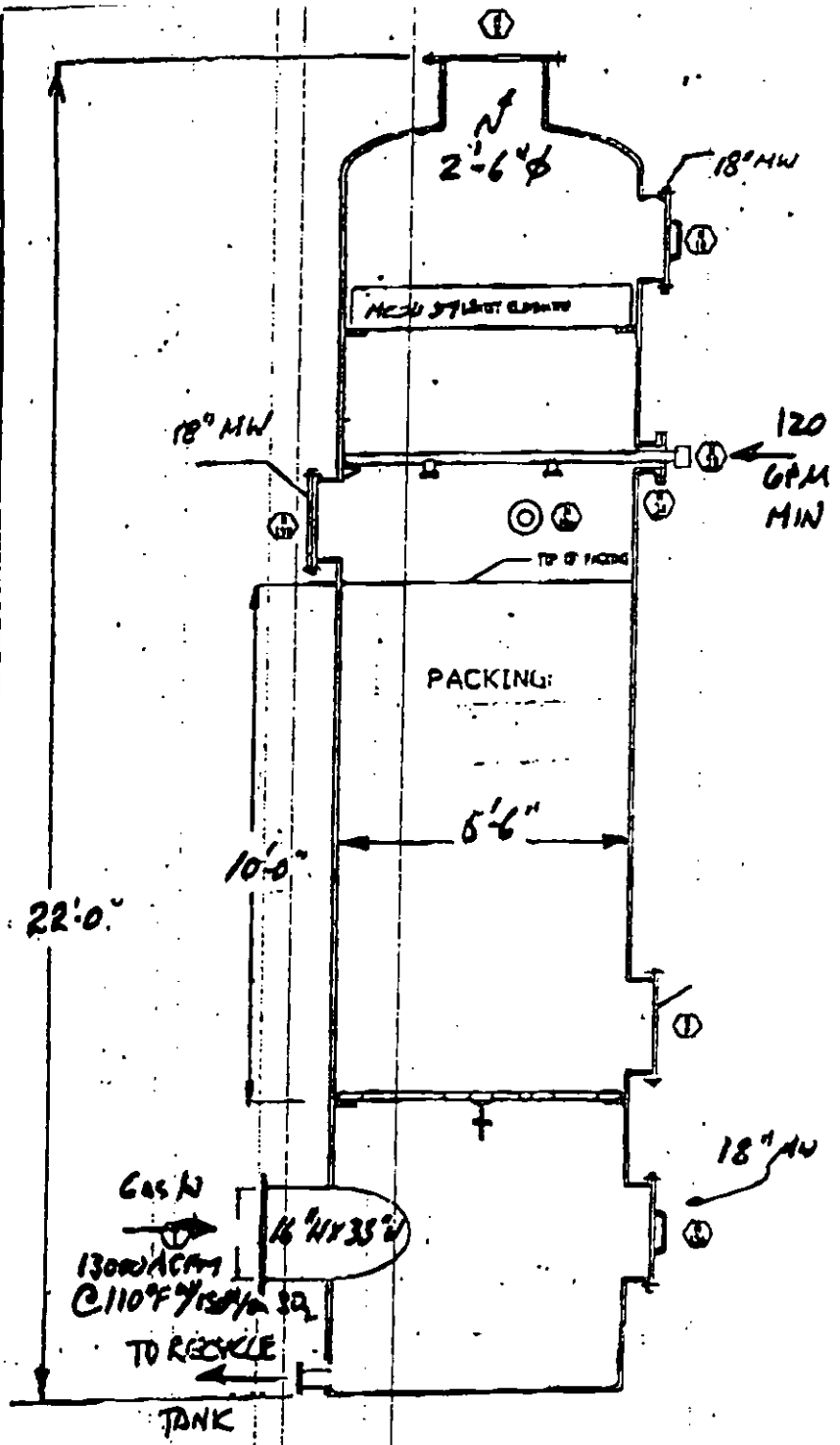
CC: J. Reynolds, BAR
Polk CO
SWD
Cleve Halladay, BAR
EPA
NPS

ATTACHMENT 1

SCRUBBER INFORMATION



PREPARED: CDT	TITLE: PROPOSED MULTIFOS KILN C	IMC-AGRIGO CO.	
DATE: 11/13/97	SCRUBBER FLOW DIAGRAM	LOCATION: NEW WALES	FILE: KILN02
REVISED: 3/4/98		SCALE: NONE	DRAWING NO: L5



NOZZLE SCHEDULE

MARK	QUANTITY	SIZE	DESCRIPTION

NOTES

1. This drawing is not to scale.
2. This drawing is for sales purposes only. No mechanical design is implied.
3. Refer to Proposal for flow, materials of construction, etc.
4. Not shown Pump and Fan. Refer to Proposal for details.
5. All nozzles are flanged 150# rating except where noted.
6. Pipe hangers are included in scope of supply, but are not shown.

OPTION NO: SO, ADDED

REV	DATE	BY	DESCRIPTION	CHECK APPD
0			PROPOSAL	

D.R. TECHNOLOGY INC.
73 SOUTH STREET FREEHOLD, N.J. 07728

PACKED COLUMN

INC 002

DRAWING: 872352 Rev 0

IMC/SO2 Absorber
Mulberry, Florida

February 19, 1998
Reference: B723 Rev. 1

EQUIPMENT TO BE SUPPLIED BY D. R. TECHNOLOGY, INC.
(Please Refer To Drawing B723-S2-R0 Attached)

ITEM 1
ONE (1)

D. R. Technology packed bed absorber column rated to treat 13,000 ACFM of SO_2 laden air with dilute caustic soda solution and remove 95 percent of 150 Lbs./Hr. entering. Vessel will be constructed completely of fiberglass reinforced vinyl ester. Unit includes a polypropylene mesh style mist eliminator mounted at its top. Unit contains a 10'-0" deep bed of 3 1/2 inch high efficiency polypropylene packing media over mounted by a spray style liquid distributor.

PROCESS CONDITIONS

Gas Flow Into Unit, ACFM	-	13,000
Temperature OF	-	110
SO_2 In Gas, Lb./Hr.	-	150
Required Caustic Solution Gal./Hr. Addition As 50 % Sol.	-	30
Once Through Flow Over Packing, GPM	-	120 @ 3 PSIG
Gas Side Pressure Drop, In. W. C.	-	5

ATTACHMENT 2

RESULTS OF SULFUR DIOXIDE EMISSIONS TEST

Run 1 **Calculations and Results**

Facility: New Wales
Plant: Multifos
Company ID: 1100
FDEP AIRS & Pt. ID: 1050059 & 036
Test Team: DC,RS

Date: 9/19/97 mm/dd/yy
Start Time: 1320 End Time: 1351

Standard Meter Volume Vms:	14.99	dscf
Average Stack Velocity:	49.69	fps
Stack Gas Volume:	47397	ACFM
Stack Gas Dry Volume:	41826	DSCFM
Isokinetic Variation:	103.70	%
Isokinetics Adjusted For Bws>Saturation:	100.76	%
Vlc calculated for Saturated Conditions:	22.83	ml H2O

Emission Calculations

Sulfur Dioxide	Total mg:	804.00	mg
		296.40	lb/hr
		7113.52	lb/day

Run 1 Data

Facility:	New Wales			
Plant:	Multifos			
Company ID:	1100			
FDEP AIRS & Pt. ID:	1050059 & 036			
Test Team:	DC,RS			
Date:	9/19/97	mm/dd/yy		
Start Time:	1320		End Time:	1351
Number ot Traverse Points:	6			
Dwell Time/Point:	5	min.		
Total Test Time:	30	min.		
Stack Diameter:	54	inches		
Stack Area:	15.90	sq. ft.		
Molecular Weight Dry Md:	28.969			
Volume of Water Vapor Condensed:	28	ml		
Weight of Water Collected in Silica Gel:	4.8	gram		
Moisture Volume Fraction Bwo:	0.0934			
Moisture Volume Saturated Bwo:	0.0669			
Moisture Percent Saturation:	140			
Moisture Used for Calculations:	0.0669			
Stack Molecular Weight Ms:	28.235			
Barometric Pressure Pb:	30.05	in Hg		
Stack Static Pressure Pv:	0.45	in H2O		
Stack Pressure Ps:	30.083	in Hg		
Average Meter Delta H:	0.790	in H2O		
Meter Pressure Pm:	30.108	in Hg		
Console Number:	3187			
Meter Delta Ha:	1.752			
Meter Correction Factor:	0.9979			
Average Meter Temperature:	90.2	deg. F		
Average Stack Temperature:	101.3	deg. F	38.5	deg C
Average Square Root Delta P:	0.851			
Meter Volume Vm:	15.57	cu. ft.		
Probe Length/Liner:	5' glass			
Cp:	0.84			
Nozzle Ident.:	0.186			
Nozzle Diameter Dn:	0.186	in.		
Impinger Set Number:	S-P3			
Average Computer K:	1.0924			

Run 1 Data Sheet

Facility: New Wales
Plant: Multifos
Team (CB/PR): DC,RS

Company ID: 1100
FDEP AIRS & Pt. ID: 1050059 & 036

Date	9/19/97		Meter Box Number	3187	
Dwell Time	5	min.	Meter Delta Ha (in. H2O)	1.752	Pitot Check
Traverse Points	6		Meter Correction Factor	0.9979	pos 5.2 in H2O
Stack Diameter	54	inches	Nozzle Ident.:	0.186	neg 4.6 in H2O
Est % Saturation	100	%	Nozzle Diameter Dn:	0.186	Leak Check
Stack Static Pressure	0.45	in H2O	Impinger Set Number:	S-P3	cfm 0.000 cfm
Barometric Pressure	30.05	in Hg	Probe length/Liner:	5' glass	vac 15 in Hg
Dry Molecular Weight	28.969		Filter Set Number	1	

Time Start 1320

Point	Time	Meter Volume	Delta P	Calc'd Delta H	Actual Delta H	Stack Temp	Meter In Temp	Meter Out Temp	Impinger Temp	Pump Vac
1	0.0	180.759	0.77	0.842	0.84	101	89	89	65	4
2	5.0	183.4	0.73	0.798	0.8	101	89	88	55	4
3	10.0	186.01	0.7	0.764	0.76	101	91	88	55	4
4	15.0	188.58	0.67	0.733	0.73	102	93	88	58	4
5	20.0	191.07	0.73	0.796	0.8	102	95	88	59	4
6	25.0	193.7	0.75	0.819	0.81	101	96	88	62	4
End	30.0	196.324								
				Average		101.3	90.2		59.0	
			0.77	Max					65	4
				Min					55	
				Range					32-68	

Time End 1351

Pitot Check		Min Value	
pos		0.77	in H2O
neg		0.77	in H2O
Leak Check			
cfm	0.000	<0.020	cfm
vac	15	4	in Hg

IMC-Agrico Company

Moisture Data Sheet

Facility New Wales Date : 9/19/97

Plant Multifos Run 1

Impinger Set Number:	S-P3			
Impinger Number:	1	2	3	4
Final (grams/mls):	219	205	104	319.4
Initial (grams/mls):	200	200	100	314.6
Difference (grams/mls):	19	5	4	4.8
Total Moisture Collected:			28 mls	4.8 gram

Sulfur Dioxide

Laboratory mg 804.00

Field Data Sheet

Run Number: 1

Facility: New Castles
Plant: M-Bos
Test Team: DC, RS

Company ID: 1100
FDEP AIRS & Pt. ID: 1050059-016

Date	9/19/97		Meter Box Number	3187	
Traverse Points	6		Meter Delta Ha (in. H2O)	1.752	
Stack Diameter	54	inches	Meter Correction Factor	.9979	
Dwell Time	5	min.	Nozzle Identification:	.126	
Est % Saturation	100	%	Nozzle Diameter Dn:	.186	
Stack Static Pressure	.45	in H2O	Impinger Set Number:	5-3	A-3
Barometric Pressure	30.05	in Hg	Probe length/Liner:	5' 6	
Dry Molecular Weight	28.969		Filter Set Number:	1	

Pitot Check
pos 5.2 in H2O
neg 4.6 in H2O

Leak Check
cfm .000
vac 15 in Hg

Time Start 1320

Point	Time	Meter Volume	Delta P	Actual Delta H	Stack Temp	Probe Temp	Hot Box Temp.	Meter In Temp	Meter Out Temp	Impinger Temp	Pump Vac
1	0	180.759	.77	.84	101	NA	NA	89	89	65	4
2	5	183.40	.73	.80	101			89	88	55	4
3	10	186.01	.70	.76	101			91	88	55	4
4	15	188.58	.67	.73	102			93	88	58	4
5	20	191.07	.83	.80	102			95	88	59	4
6	25	193.70	.75	.81	101			96	88	62	4
7	30	196.324									
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
End											

Time End 1351

Pitot Check
pos ____ in H2O
neg ____ in H2O

Leak Check
cfm .000
vac 15 in Hg

ATTACHMENT 3

UPDATED SO2 AND NOx EMISSIONS ESTIMATES

SULFUR DIOXIDE EMISSIONS

SO2 into scrubber	=	150 lbs/hr (based on stack test)
SO2 control	=	95 percent (based on manufacturer guarantee)
SO2 emitted	=	150 lbs/hr x (1-0.95)
	=	7.5 lbs/hr x 8760 hrs/yr x ton/2000 lbs
	=	32.9 tpy

The estimated SO2 emission rate is less than the PSD significant level of 40 tpy.

NITROGEN OXIDES EMISSIONS

KILN:

#6 Fuel Oil	=	56 MMBtu/hr x gal/150,000 Btu
	=	373 gal/hr, or 0.373 E3 gph
#6 Oil/yr	=	110,000 gal/yr, or 110 E3 gpy
Hrs/yr,	=	110,000 gpy / 373 gph
at max. rate	=	295 hrs/yr
NOx / yr	=	110 E3 gpy x 55 lb/E3 gal x ton/2000 lbs
	=	3.0 tpy
#2 Fuel Oil NOx	=	0.4 E3 gph x 20 lb/E3 gal
	=	8.0 lbs/hr x (8760 - 295) hrs/yr x ton/2000 lbs
	=	33.9 tpy

As previously submitted for the dryer, with No. 6 fuel oil used for 400 hours per year,

DRYER:

#6 Fuel Oil NOx	=	11.2 E3 gpy x 55 lb/E3 gal x ton/2000 lbs
	=	0.3 tpy
#2 Fuel Oil NOx	=	0.03 E3 gph x 20 lb/E3 gal
	=	0.6 lb/hr x (8760 - 400) hrs/yr
	=	2.5 tpy

The combined total NOx emissions can be estimated as follows:

Total NOx	=	3.0 TPY (Kiln, No. 6 fuel oil)
		+ 33.9 TPY (Kiln, No. 2 fuel oil)
		+ 0.3 TPY (Dryer, No. 6 fuel oil)
		+ 2.5 TPY (Dryer, No. 2 fuel oil)
	=	39.7 TPY total

The estimated NOx emission rate is less than the PSD significant level of 40 tpy.

ATTACHMENT 4

CORRESPONDENCE REGARDING VISIBLE EMISSIONS

IMC FERTILIZER, INC.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED BY
C. D. TURLEY
JAN 21 1992

COPIES _____
ROUTE TO _____

January 21, 1992

Mr. J. Harry Kerns, P.E.
District Air Engineer
Florida Department of Environmental
Regulation
4520 Oak Fair Boulevard
Tampa, Florida 33610-7347

RE: DER File No. AO53-206083
(Renewal of AO53-127484)
Multifos Production

Dear Mr. Kerns:

In response to your letter of January 14, 1992, IMC Fertilizer, Inc., New Wales Operations still wishes to have the Department establish a higher opacity standard based on 17-2.610(2)(a)3.

The semiannual compliance tests clearly demonstrate our ability to meet the particulate limits stipulated in the Operations permit. It is also evident from our corresponding VE data, that the original request for an alternate 45% opacity would be inadequate. New Wales has no logical answer as to why this particular facility appears to leave a unique light scattering capability that varies without direct correlation to particulate loading. Although we have given 15 days advance notice to the Department prior to compliance testing, we have been remiss in requesting their presence to verify testing as stipulated in Mr. Fancy's letter of November 14, 1986 (copy attached). However, the New Wales personnel are certified VE readers.

The following is a tabulation of all the compliance tests since the Department's letter of November 14, 1986. Additionally, a qualitative attempt to correlate the opacity and mass emissions of this source is included as a graph and a table. This should be considered as a representation of the trend in this stack. This correlation has been previously submitted by IMC Fertilizer. Based on the graph, we believe that an alternative opacity standard of 60% is indicated.

IMC Fertilizer, Inc. • New Wales Operations
P. O. Box 1035 • Hwy. 640 West • Mulberry, Florida 33860 • (813) 428-2531

Test Date	Plant Rate TPH	Particulate Lbs./Hour	% VE
02/87	17.4	12.78	15
10/87	21.8	12.63	14
03/88	16.5	17.63	45
10/88	25.0	12.13	35
02/89	25.0	18.02	56
08/89	19.5	14.42	58
03/90	24.5	20.16	42
10/90	20.0	17.85	73
04/91	21.0	22.61	47
08/91	22.0	5.37	31

It is apparent from the data that VE relief is required or should be waived. Please advise us how to proceed if this data or request is insufficient.

Sincerely,

J. M. Baretincic
Director
Environmental Services

JMB:lmr
063/#9
Attachments

cc: J. A. Brafford
E. M. Newberg
W. C. Thomas, P.E. - DER

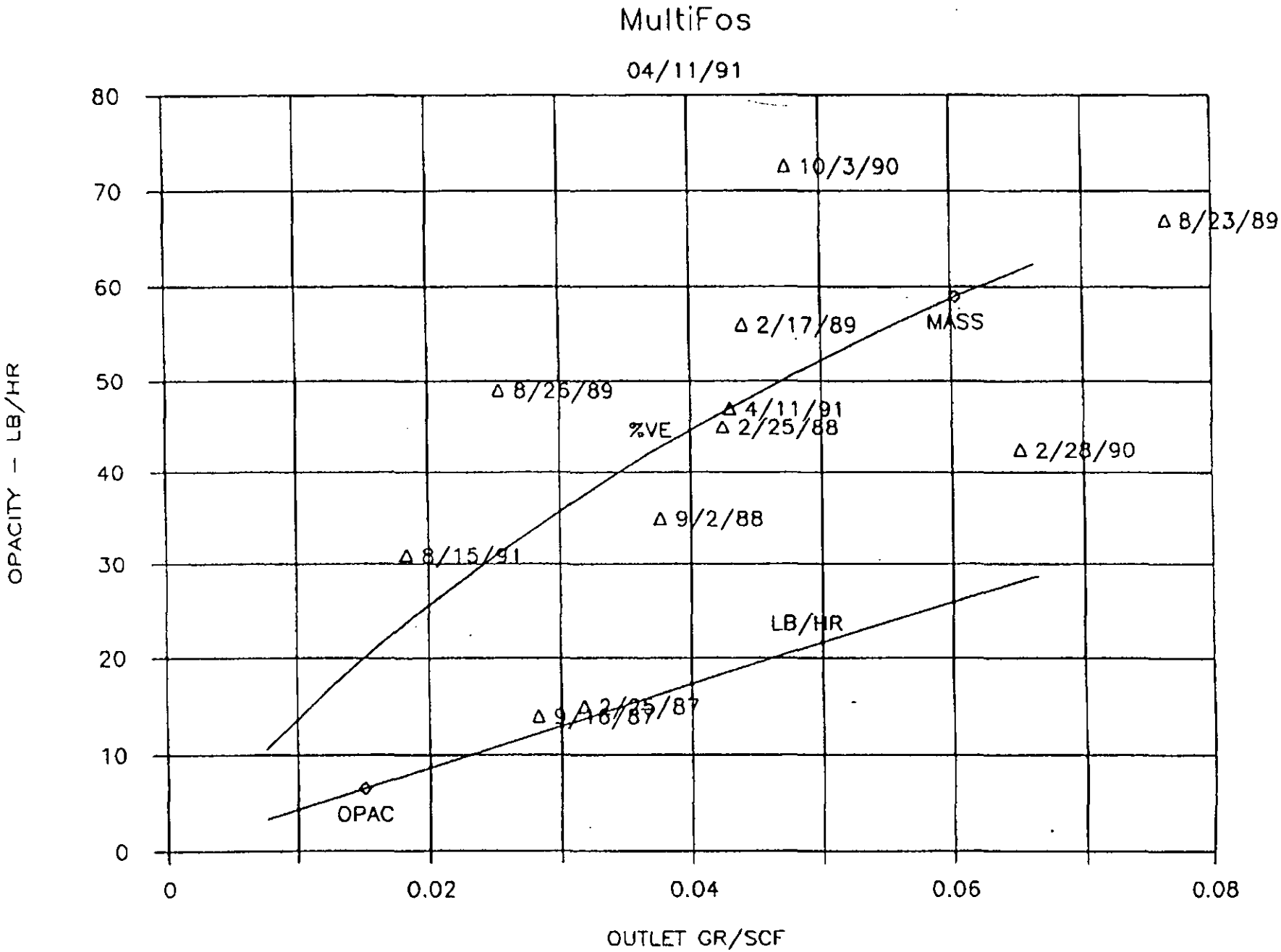

MultiFos
04/11/91
80
70
60
50
40
30
20
10
0
0
0.02
0.04
0.06
0.08
OPACITY - LB/HR
OUTLET GR/SCF
Δ 10/3/90
Δ 8/23/89
Δ 2/17/89
MASS
Δ 8/26/89
Δ 4/11/91
%VE
Δ 2/25/88
Δ 2/28/90
Δ 9/2/88
Δ 8/15/91
LB/HR
Δ 9/16/87
OPAC

TABLE	TEST:	50449	scfm			54 dia L				Resulting EFF		
OPACITY &		0.0430	gr/scf			Estimated Inlet				CALC	84.9%	
EFFICIENCY		18.58	lb/hr			0.2855 gr/scf			MIN:	OPAC	94.7%	
ESTIMATES		47.0	%VE			1.3 Density				MASS	78.9%	
MultiFos										0.042		
04/11/91			RAYM	INLET	0.46446	=Kf	3.780	=Sfi		FINAL	8.777	=Sfo
	mean		wt	lb/hr	gr/scf	CALC	EXTN	CUM		lb/hr	gr/scf	CUM
SIZE RANGE	dia	POLYC	dist	123.4	0.28545	POP	COEF	OPAC		18.58	0.0430	OPAC
Di-Du	D	EFF	V%	PMRi	Gin	RN	Q	in		PMRo	Gout	out
0.00-0.10	0.0794	0.0100	0.0015	0.19	0.00043	0.262	1.058	1.0		0.183	0.00042	0.95
0.10-0.13	0.1169	0.0300	0.0025	0.31	0.00071	0.137	1.559	2.5		0.299	0.00069	2.47
0.13-0.16	0.1465	0.0800	0.0040	0.49	0.00114	0.111	1.954	5.0		0.454	0.00105	4.74
0.16-0.20	0.1822	0.1200	0.0080	0.99	0.00228	0.116	2.429	9.7		0.869	0.00201	8.94
0.20-0.25	0.2277	0.2000	0.0140	1.73	0.00400	0.104	3.037	17.5		1.382	0.00320	15.24
0.25-0.32	0.2892	0.3100	0.0240	2.96	0.00685	0.087	3.856	29.2		2.044	0.00473	23.77
0.32-0.40	0.3644	0.4200	0.0360	4.44	0.01028	0.065	4.000	41.5		2.577	0.00596	31.71
0.40-0.50	0.4555	0.5600	0.0500	6.17	0.01427	0.046	4.000	52.6		2.716	0.00628	37.76
0.50-0.64	0.5785	0.6800	0.0700	8.64	0.01998	0.032	4.000	62.4		2.765	0.00639	42.22
0.64-0.79	0.7228	0.8000	0.0800	9.87	0.02284	0.019	4.000	69.6		1.975	0.00457	44.63
0.79-1.00	0.9072	0.8700	0.0900	11.11	0.02569	0.011	4.000	74.9		1.444	0.00334	45.98
1.00-1.26	1.1448	0.9250	0.1100	13.58	0.03140	0.006	3.710	78.8		1.018	0.00236	46.67
1.26-1.59	1.4439	0.9620	0.1050	12.96	0.02997	0.003	3.112	81.0		0.493	0.00114	46.89
1.59-2.00	1.8181	0.9820	0.1194	14.74	0.03408	0.002	2.364	82.4		0.265	0.00061	46.96
2.00-2.52	2.2895	0.9940	0.0887	10.95	0.02532	0.001	2.000	83.0		0.066	0.00015	46.98
2.52-3.17	2.8817	0.9968	0.0615	7.59	0.01756	0.000	2.000	83.4		0.024	0.00006	46.98
3.17-4.00	3.6324	0.9988	0.0417	5.15	0.01190	0.000	2.000	83.6		0.006	0.00001	46.98
4.00-5.04	4.5790	0.9996	0.0249	3.07	0.00711	0.000	2.000	83.6		0.001	0.00000	46.98
5.04-6.35	5.7694	0.9999	0.0122	1.51	0.00348	0.000	2.000	83.7		0.000	0.00000	46.98
6.35-8.00	7.2686	1.0000	0.0065	0.80	0.00186	0.000	2.000	83.7		0.000	0.00000	46.98
8.00-10.08	9.1581	1.0000	0.0052	0.64	0.00148	0.000	2.000	83.7		0.000	0.00000	46.98
10.08-12.70	11.5387	1.0000	0.0040	0.49	0.00114	0.000	2.000	83.7		0.000	0.00000	46.98
12.70-16.00	14.5373	1.0000	0.0065	0.80	0.00186	0.000	2.000	83.7		0.000	0.00000	46.98
16.00-20.16	18.3162	1.0000	0.0028	0.35	0.00080	0.000	2.000	83.7		0.000	0.00000	46.98
20.16-25.40	23.0774	1.0000	0.0019	0.23	0.00054	0.000	2.000	83.7		0.000	0.00000	46.98
25.40-32.00	29.0745	1.0000	0.0037	0.46	0.00106	0.000	2.000	83.7		0.000	0.00000	46.98
32.00-40.30	36.6203	1.0000	0.0037	0.46	0.00106	0.000	2.000	83.7		0.000	0.00000	46.98
40.30-50.80	46.1472	1.0000	0.0075	0.93	0.00214	0.000	2.000	83.7		0.000	0.00000	46.98
50.80-64.00	58.1491	1.0000	0.0148	1.83	0.00422	0.000	2.000	83.7		0.000	0.00000	46.98

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

RECEIVED BY
J. M. BARETINCIC

NOV 20 1986

November 14, 1986

Mr. J. M. Baretincic, Manager
Environmental Services and Quality Control
International Minerals & Chemical Corporation
New Wales Operations
P. O. Box 1035
Mulberry, Florida 33860

Dear Mr. Baretincic:

Mr. W. C. Thomas has forwarded your September 15, 1986, letter to the Bureau of Air Quality Management. We understand that two of your existing plants, Multifos and AFI, are unable to consistently comply with the visible emissions standard while the plants and control equipment are being properly operated. You are requesting relief from the general visible emissions standard pursuant to Rule 17-2.610(2)(a)1., FAC. Relief from the visible emissions standard is available if the plants comply with the particulate matter standards, the plants and control equipment are operated and maintained properly, and neither the plants nor controls are capable of being adjusted to meet the visible emissions standard.

We also acknowledge receipt of the test results on these plants that show excess visible emissions when the plants were being operated in compliance with the particulate matter standards. The department will need to study the plants and control equipment operations along with the emissions data before we can make a decision on your request. Historical data that may help the department resolve this matter are all test results of simultaneous particulate matter and visible emissions tests (including those that complied with both standards) along with the plant and control equipment parameters that existed during these tests. Also, several simultaneous tests that are observed by department personnel will be needed before your request can be evaluated. These tests need to be coordinated with Mr. Thomas. We recommend you contact Mr. Thomas and agree on a procedure to coordinate the tests and establish what data is needed to evaluate your request.

All data on these plants should be submitted to Mr. Thomas and a copy sent to the Bureau. He will evaluate the data, with

the Bureau's assistance, and render a decision on your request. If relief is approved, the permits for these sources will be revised.

If you have any questions on this matter, please call Mr. Thomas or write to me at the letterhead address.

Sincerely,

C. H. Pancy, P.E.
Deputy Bureau Chief
Bureau of Air Quality
Management

CHF/WH/ks

cc: Mr. W.C. Thomas

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

IN REPLY REFER TO

January 7, 1998

Mr. C. H. Fancy
Chief, Bureau of Air Regulation
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399-2400

Dear Mr. Fancy:

Our Air Quality Branch has reviewed the Prevention of Significant Deterioration Application for the new kiln at IMC-Agrico Company's Multifos Plant in Polk County. The plant is located 102 km southeast of Chassahowitzka Wilderness, a Class I air quality area, administered by the Fish and Wildlife Service. The technical review comments from our Air Quality Branch are enclosed. In addition, we are enclosing the "Interim Visibility Modeling Guidance for Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida." Please provide this document to future PSD applicants. Our Air Quality Branch is compiling a more detailed and comprehensive document addressing visibility analyses that will be available in early 1998.

Thank you for giving us the opportunity to comment on this permit application. We appreciate your cooperation in notifying us of proposed projects with the potential to impact the air quality and related resources of our Class I air quality areas. If you have any questions, please contact Ms. Ellen Porter of our Air Quality Branch in Denver at 303/969-2617.

Sincerely yours,

H Dale Hall

for Sam D. Hamilton
Regional Director

Enclosures

cc: D. Reynolds, BAR
Koogler & Assoc
Polk Co.
SWD
Cleve Holladay, BAR

Technical Review of Prevention of Significant Deterioration Permit Application for a Rotary Kiln at IMC-Agrico Company's Multifos Plant Polk County, Florida

by

Air Quality Branch, Fish and Wildlife Service – Denver
December 29, 1997

IMC-Agrico Company is proposing to install an additional rotary kiln at its New Wales phosphate chemical fertilizer manufacturing facility near Mulberry, Florida (Polk County). The kiln will calcine phosphate rock, soda ash, and phosphoric acid at high temperatures to produce an animal feed supplement. There are two existing kilns at the facility and the addition of the new kiln will significantly increase the production of the Multifos Plant (from a 30 ton per hour (tph) raw material feed rate to 55 tph raw material feed rate). The plant is located 102 km southeast of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The project will result in significant increases in emissions of fluoride (F), fine particulate matter (PM-10), and sulfur dioxide (SO_2). Emissions (in tons per year – TPY) are summarized below.

POLLUTANT	EMISSIONS INCREASE (TPY)
SO_2	185
PM-10	124
F	15.3

We do not expect this project to significantly affect air quality or air quality related values at Chassahowitzka Wilderness. However, we have the following questions and concerns regarding the project.

Net Emissions Increases Calculations

IMC has included in its calculations the increases in emissions that would occur from the existing dryer due to its increased utilization to feed the new kiln. However, IMC has not considered the effect of the proposed project upon other existing emission units at the IMC facility. For example, the new kiln would require the increased production of phosphoric acid, resulting in increased fluoride emissions. In addition, production of phosphoric acid typically requires sulfuric acid and phosphate rock. Therefore, the SO_2 and PM-10 emissions that result from production and use of these substances at IMC should be included. For example, the additional 83,220 tons per year (TPY) of phosphoric acid required for the new kiln would also require the production of almost 100,000 TPY of sulfuric acid. If SO_2 emissions are limited to 4.0 lb/ton (New Source Performance Standard), the resulting SO_2 emissions would approach 200 TPY.

Best Available Control Technology (BACT) Analysis

IMC proposes to use a packed bed scrubber, using process water and alkaline slurry, to control fluoride emissions from the kiln. Although this technology represents BACT for this type of process, no control efficiency is proposed. Instead, IMC proposes to meet the State's limit of 0.37 lb fluoride per ton of phosphoric acid input for existing sources. We suggest that FDEP include a limit requiring that the scrubber demonstrate 99.9% fluoride control efficiency. This level of control is reflective of that required by the permit issued by Florida to Farmland Hydro in 1992 for a phosphate fertilizer process, and would insure that the scrubber is operated to its capabilities.

Air Quality Analysis

The results of the air quality analysis indicate that the project will not contribute significantly to consumption of the Class I increments for SO_2 and PM-10. This analysis would, of course, be incorrect if FDEP determines that the net emissions increases should be adjusted (see above).

Air Quality Related Values (AQRV) Analysis

IMC analyzed potential impacts to vegetation, soils, and wildlife in Chassahowitzka Wilderness. We agree that the potential for impacts to these AQRVs is low because of the distance of the project and the types and amounts of emissions

IMC conducted both a VISCREEN analysis, to assess potential visible plume impacts, and a regional haze analysis. Both analyses predicted that this project would have a low potential to affect visibility at Chassahowitzka. However, we would like to clarify several points regarding these analyses. Please note that we have also provided this clarification in recent letters to your department (re: Piney Point Phosphates and Farmland Hydro).

First, only sources located less than 50 km from a Class I area should perform a plume impact analysis (VISCREEN). Plumes do not remain coherent beyond 50 km. Sources 50 km or more from a Class I area should perform a regional haze analysis. The attached guidance document, "Interim Visibility Modeling Guidance for Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida," discusses visibility analyses in more detail.

Please note in the attached visibility guidance document that all sources should compare their contribution to regional haze to the screening level of 0.5 deciview. If their predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including proposed emissions and all other increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts. Because IMC's maximum

predicted regional haze impact (0.2 deciview) was less than the screening level of 0.5 deciview, no further analysis is required.

In addition to the attached visibility guidance document, our office is compiling a more detailed and comprehensive document addressing visibility analyses that will be available in early 1998.

Contact: Ellen Porter, Air Quality Branch
303/969-2617

Interim Visibility Modeling Guidance For Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida December 1997

This Interim Visibility Modeling Guidance Document has been developed for use by PSD permit applicants seeking to locate or expand near Chassahowitzka Wilderness, a Class I area administered by the U.S. Fish and Wildlife Service (FWS). A more detailed, comprehensive guidance document will be available in early 1998.

Applicants should assume a background visual range of 65 km for Chassahowitzka Wilderness.

***Sources less than 50 km from a Class I area*:**

Sources ***less than 50 km*** from a Class I area should perform an analysis to assess the potential for visible plumes from their emissions at the Class I area. The recommended models are VISCREEN (Levels 1 and 2) as the screening model and PLUVUE II as the more refined model. If the screening or refined modeling predicts an impact less than a delta E of 2.0 and a contrast of 0.05, no plume impact is expected and no further analysis is required. If the modeling predicts an impact equal to or greater than the 2.0 or 0.05 values, the potential for plume impacts is significant and the FLM will determine on a case-by-case basis whether or not those impacts would be adverse, considering predicted frequency, magnitude, duration, and other factors.

Sources greater than or equal to 50 km from a Class I area:

Sources ***greater than or equal to 50 km*** from a model receptor in a Class I area should perform an analysis to assess the potential for a significant increase in uniform (i.e., regional) haze in the Class I area due to the source's emissions. The source may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If the predicted impact is less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If the predicted impact is greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including the new source's proposed emissions and all other increment-consuming emissions. If the cumulative analysis predicts an impact less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If the cumulative impact is greater than 1.0 deciview, a significant increase in haze is possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the predicted frequency, magnitude, and duration of impacts.

Contact: Bud Rolofson, FWS Air Quality Branch (303) 969-2804

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 31, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. M. Newberg
Vice President and General Manager
IMC-Agrico Company
P.O. Box 2000
Mulberry, Florida 33860

Re: DEP File No. 1050059-024-AC (PSD-FL-244)
New Wales Multiphos Plant

Dear Mr. Newberg:

The Department has received the attached comments from the Fish and Wildlife Service by facsimile. These comments are based on their technical review of IMC-Agrico's application received on December 1, 1997 for new equipment to be installed in the Multiphos Plant. Please respond to their comments concerning the net emissions increases calculations and the Best Available Control Technology (BACT) analysis. This additional information is required to process the application.

The Department will resume processing this application after receipt of the requested information. If you have any questions on this matter, please call Cleve Holladay or John Reynolds at 850/488-1344.

Sincerely,

12/31

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/ch

Enclosures

cc: Bill Thomas, SWD
Joe King, Polk Co.
John Koogler, K&A
Brian Beals, EPA
John Bunyak, NPS

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH
P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: 12/29

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Cleve Holladay

From: Ellen Porter

Subject: IMC - tech review document - incorporates Don's comments

Number of Pages:
(Including this cover sheet) 4

Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235

Technical Review of Prevention of Significant Deterioration Permit Application for a Rotary Kiln at IMC-Agrico Company's Multifos Plant Polk County, Florida

by

Air Quality Branch, Fish and Wildlife Service – Denver
December 29, 1997

IMC-Agrico Company is proposing to install an additional rotary kiln at its New Wales phosphate chemical fertilizer manufacturing facility near Mulberry, Florida (Polk County). The kiln will calcine phosphate rock, soda ash, and phosphoric acid at high temperatures to produce an animal feed supplement. There are two existing kilns at the facility and the addition of the new kiln will significantly increase the production of the Multifos Plant (from a 30 ton per hour (tph) raw material feed rate to 55 tph raw material feed rate). The plant is located 102 km southeast of Chassahowitzka Wilderness, a Class I air quality area administered by the U.S. Fish and Wildlife Service. The project will result in significant increases in emissions of fluoride (F), fine particulate matter (PM-10), and sulfur dioxide (SO_2). Emissions (in tons per year – TPY) are summarized below.

POLLUTANT	EMISSIONS INCREASE (TPY)
SO_2	185
PM-10	124
F	15.3

We do not expect this project to significantly affect air quality or air quality related values at Chassahowitzka Wilderness. However, we have the following questions and concerns regarding the project.

Net Emissions Increases Calculations

IMC has included in its calculations the increases in emissions that would occur from the existing dryer due to its increased utilization to feed the new kiln. However, IMC has not considered the effect of the proposed project upon other existing emission units at the IMC facility. For example, the new kiln would require the increased production of phosphoric acid, resulting in increased fluoride emissions. In addition, production of phosphoric acid typically requires sulfuric acid and phosphate rock. Therefore, the SO_2 and PM-10 emissions that result from production and use of these substances at IMC should be included. For example, the additional 83,220 tons per year (TPY) of phosphoric acid required for the new kiln would also require the production of almost 100,000 TPY of sulfuric acid. If SO_2 emissions are limited to 4.0 lb/ton (New Source Performance Standard), the resulting SO_2 emissions would approach 200 TPY.

Best Available Control Technology (BACT) Analysis

IMC proposes to use a packed bed scrubber, using process water and alkaline slurry, to control

fluoride emissions from the kiln. Although this technology represents BACT for this type of process, no control efficiency is proposed. Instead, IMC proposes to meet the State's limit of 0.37 lb fluoride per ton of phosphoric acid input for existing sources. We suggest that FDEP include a limit requiring that the scrubber demonstrate 99.9% fluoride control efficiency. This level of control is reflective of that required by the permit issued by Florida to Farmland Hydro in 1992 for a phosphate fertilizer process, and would insure that the scrubber is operated to its capabilities.

Air Quality Analysis

The results of the air quality analysis indicate that the project will not contribute significantly to consumption of the Class I increments for SO_2 and PM-10. This analysis would, of course, be incorrect if FDEP determines that the net emissions increases should be adjusted (see above).

Air Quality Related Values (AQRV) Analysis

IMC analyzed potential impacts to vegetation, soils, and wildlife in Chassahowitzka Wilderness. We agree that the potential for impacts to these AQRVs is low because of the distance of the project and the types and amounts of emissions

IMC conducted both a VISCREEN analysis, to assess potential visible plume impacts, and a regional haze analysis. Both analyses predicted that this project would have a low potential to affect visibility at Chassahowitzka. However, we would like to clarify several points regarding these analyses. Please note that we have also provided this clarification in recent letters to your department (re: Piney Point Phosphates and Farmland Hydro).

First, only sources located less than 50 km from a Class I area should perform a plume impact analysis (VISCREEN). Plumes do not remain coherent beyond 50 km. Sources 50 km or more from a Class I area should perform a regional haze analysis. The attached guidance document, "Interim Visibility Modeling Guidance for Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida," discusses visibility analyses in more detail.

Please note in the attached visibility guidance document that all sources should compare their contribution to regional haze to the screening level of 0.5 deciview. If their predicted impacts are less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If predicted impacts are greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including proposed emissions and all other increment-consuming sources. If the cumulative analysis predicts impacts less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If cumulative impacts are greater than 1.0 deciview, significant haze impacts are possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the frequency, magnitude, and duration of impacts. Because IMC's maximum predicted regional haze impact (0.2 deciview) was less than the screening level of 0.5 deciview, no further analysis is required.

In addition to the attached visibility guidance document, our office is compiling a more detailed and comprehensive document addressing visibility analyses that will be available in early 1998.

Contact: Ellen Porter, Air Quality Branch (303) 969-2617.

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH
P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: 12/29

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Cleve Holladay

From: Ellen Porter

Subject: IMC

Number of Pages: 2
(Including this cover sheet)

Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235

MEMORANDUM

To: **Ellen Porter**

From: **Don Shepherd**

Subject: **IMC-Agrico BACT Review**

Date: **December 29, 1997**

IMC-Agrico proposes to add a third kiln to its New Wales facility to calcine phosphate rock for the production of an animal feed supplement. Equipment to be added would also include a cooler and additional screens and mills for product sizing. IMC-Agrico's application is based on the premise that it triggers regulations for the Prevention of Significant Deterioration (PSD) of air quality for fluorides, particulate matter, and sulfur dioxide (SO_2). Any pollutant subject to PSD must be controlled through the use of Best Available Control Technology (BACT).

One overarching issue that must be addressed is the effect of the proposed project upon other existing emission units at this source. Although IMC-Agrico has quantified the increases in emissions that occur at the existing dryer due to its utilization to feed the new kiln, it should also include the increase in emissions that would occur at the phosphoric and sulfuric acid plants that also supply materials to the new kiln. Because the new kiln will require the production of additional phosphoric acid to supply its input, the resulting increase in fluorides must be considered. Furthermore, because production of more phosphoric acid typically requires the use of more sulfuric acid and phosphate rock, the SO_2 and PM emissions that result from production and use of these substances at this source must be included. For example, the additional 83,220 tons per year (TPY) of phosphoric acid required for the new kiln will also require the production of almost 100,000 TPY of sulfuric acid. If SO_2 emissions are limited to 4.0 lb/ton (New Source Performance Standard), the resulting SO_2 emissions could approach 200 TPY.

Although the control technology proposed, a packed bed scrubber using process water and alkaline slurry, represents BACT for this type of process, no control efficiency is proposed. Instead of simply defaulting to the state's limit of 0.37 lb fluoride per ton of phosphoric acid input for existing sources, a limit requiring that the scrubber demonstrate 99.9% fluoride control efficiency should be included. This level of control is reflective of that required by the permit issued by Florida to Farmland Hydro in 1992 for a phosphate fertilizer process, and would insure that the scrubber is operated to its capabilities.

U.S.FISH&WILDLIFE SERVICE
AIR QUALITY BRANCH
P.O. BOX 25287, Denver, CO 80225-0287

FACSIMILE COVER SHEET

Date: 12/11

Telephone: (303) 969-2617
Fax: (303) 969-2822

To: Cleve Holladay

From: Ellen Porter

Subject: Interim Visib. Guidance - Visib gurus (Notar, Vimont, etc) are developing more detailed paper to be released in late Jan. - Feb.

Number of Pages:
(Including this cover sheet) 2

Office Location: 7333 West Jefferson Ave, Suite 450, Lakewood, CO 80235

John -
would you review
this?
Ellen

Interim Visibility Modeling Guidance For Sources Locating or Expanding Near Chassahowitzka Wilderness, Florida December 1997

This Interim Visibility Modeling Guidance Document has been developed for use by PSD permit applicants seeking to locate or expand near Chassahowitzka Wilderness, a Class I area administered by the U.S. Fish and Wildlife Service (FWS). A more detailed, comprehensive guidance document will be available in early 1998.

Applicants should assume a background visual range of 65 km for Chassahowitzka Wilderness.

Sources less than 50 km from a Class I area:

Sources ***less than 50 km*** from a Class I area should perform an analysis to assess the potential for visible plumes from their emissions at the Class I area. The recommended models are VISCREEN (Levels 1 and 2) as the screening model and PLUVUE as the more refined model. If the screening or refined modeling predicts an impact less than a delta E of 2.0 and a contrast of 0.05, no plume impact is expected and no further analysis is required. If the modeling predicts an impact equal to or greater than the 2.0 or 0.05 values, the potential for plume impacts is significant and the FLM will determine on a case-by-case basis whether or not those impacts would be adverse, considering predicted frequency, magnitude, duration, and other factors.

II @

Sources greater than or equal to 50 km from a Class I area:

Sources ***greater than or equal to 50 km*** from a Class I area should perform an analysis to assess the potential for a significant increase in uniform (i.e., regional) haze in the Class I area due to the source's emissions. The source may choose to use a screening model (e.g., ISC) or a more refined model (e.g., Mesopuff or Calpuff). If the predicted impact is less than or equal to 0.5 deciview, the impact is considered insignificant and no further analysis is needed. If the predicted impact is greater than 0.5 deciview, the applicant should conduct a cumulative modeling analysis including THE NEW SOURCE proposed emissions and all other increment-consuming emissions. If the cumulative analysis predicts an impact less than or equal to 1.0 deciview, the impact is considered insignificant and no further analysis is needed. If the cumulative impact is greater than 1.0 deciview, a significant increase in haze is possible and FWS will make a case-by-case adverse impact determination regarding the proposed project, considering the predicted frequency, magnitude, and duration of impacts.

Contact: Bud Rolofson, FWS Air Quality Branch (303) 969-2804

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Mr. E. M. Newberg, VP & GM
IMC-Agrico
P O Box 2000
Mulberry, Fl
33860

4a. Article Number
P 265 659 275

4b. Service Type
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☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

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PS Form **3800**, April 1995

105C059-024-AC
PSD-FL-244

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

December 16, 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. E. M. Newberg
Vice President and General Manager
IMC-Agrico Company
P.O. Box 2000
Mulberry, Florida 33860

Re: DEP File No. 1050059-024-AC (PSD-FL-244)
New Wales Multiphos Plant

Dear Mr. Newberg:

The Department has reviewed IMC-Agrico's application received on December 1, 1997 for new equipment to be installed in the Multiphos Plant. The additional information listed below is required to process the application.

1. A detailed description of the proposed emission control system is needed including control system flow rates (gas and liquid streams), pond water fluoride concentrations and temperatures, and the proposed SO_2 removal efficiency and cost effectiveness calculations. The additional information should be sufficiently detailed to allow a determination of achievable emission levels through mass transfer calculations. A thorough assessment of the cost effectiveness of the various SO_2 control options including a separate countercurrent scrubber vs. the proposed crossflow add-on should be done.

2. Please explain why the SO_2 scrubbing system performance was not specified. SO_2 scrubbing is sufficiently advanced that the reagent and its performance can be specified prior to construction. Also explain the sulfurous acid/stripper system indicated on Drawing L5.

3. Along with the Appendix D information to be submitted, please provide all SO_2 emission test results that have been obtained for this plant to date.

4. NO_X emissions based on AP-42 factors exceed the PSD significance level when No. 6 oil is used for 400 hours (Kiln: 4.1 TPY for No. 6; 33.4 TPY for No. 2; Dryer: 0.3 TPY for No. 6; 2.5 TPY for No. 2 = 40.3 TPY total). To resolve PSD-applicability concerns, EPA Method 7E emission tests should be performed while burning each of the fuels used and the results submitted along with Appendix D.

The Department will resume processing this application after receipt of the requested information. If you have any questions on this matter, please call John Reynolds at 850/488-1344.

Sincerely,

12/16

A. A. Linero, P.E. Administrator
New Source Review Section

AAL/jr

cc: Bill Thomas, SWD
Joe King, Polk Co.
John Koogler, K&A
Brian Beals, EPA
John Bunyak, NPS

Fold at line over top of envelope to the right of the return address

SENDER:
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Consult postmaster for fee.

3. Article Addressed to:
E.M. Newberg
IMC-Agrico
P O Box 2000
Mulberry, Fl
33860

4a. Article Number
P 265 659 268

4b. Service Type
☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
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5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X Joseph Howell

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Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

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Post Office, State, & ZIP Code Mulberry, Fl	
Postage	$
Certified Fee	
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050059-024-AC
PSO-FL-244