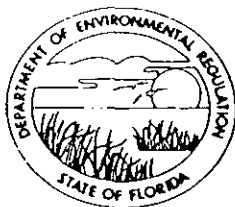


STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION



APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Sulfuric Acid Plant [] New¹ [X] Existing¹

APPLICATION TYPE: [] Construction [] Operation [X] Modification

COMPANY NAME: Cargill Fertilizer, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e., Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) No. 8 Sulfuric Acid Plant

SOURCE LOCATION: Street 8813 Highway 41 South City Riverview

UTM: East 363.3

North 3082.4

Latitude 27 ° 51 ' 28 "N

Longitude 82 ° 23 ' 15 "W

APPLICANT NAME AND TITLE: David Jellerson, Environmental Supervisor

APPLICANT ADDRESS: 8813 Highway 41 South, Riverview, FL 33569

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Cargill Fertilizer, Inc.

I certify that the statements made in this application for a Construction permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: _____

David Jellerson, Environmental Supervisor
Name and Title (Please Type)

Date: _____ Telephone No. (813) 677-6153

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)
This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that

¹See Florida Administration Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David A. Buff
Name (Please Type)

KBN Engineering and Applied Sciences, Inc.
Company Name (Please Type)

1034 N.W. 57th Street, Gainesville, FL 32605
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 6/10/94 Telephone No. (904) 331-9000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

See cover letter.

B. Schedule of project covered in this application (Construction Permit Application Only)
Start of Construction upon permit issuance Completion of Construction 24 mos after permit issued

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Air pollution controls already in place.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

See PSD report for No. 9 Sulfuric Acid Plant.

E. Requested permitted equipment operating time: hrs/day 24; days/wk 7; wks/yr 52;
If power plant, hrs/yr _____; if seasonal, describe: _____

F. If this is a new source or major modification, answer the following questions.
(Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes
- a. If yes, has "offset" been applied? No
 - b. If yes, has "Lowest Achievable Emission Rate" been applied? No
 - c. If yes, list non-attainment pollutants. Ozone
2. Does best available control technology (BACT) apply to this source?
If yes, see Section VI. Yes
3. Does the State "Prevention of Significant Deterioration" (PSD)
requirement apply to this source? If yes, see Sections VI and VII. Yes
4. Do "Standards of Performance for New Stationary Sources" (NSPS)
apply to this source? Yes
5. Do "National Emission Standards for Hazardous Air Pollutants"
(NESHAP) apply to this source? No
- H. Do "Reasonably Available Control Technology" (RACT) requirements apply
to this source? No
 - a. If yes, for what pollutants? _____
 - b. If yes, in addition to the information required in this form, any information
requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any
justification for any answer of "No" that might be considered questionable.

No. 9 Sulfuric Acid Plant

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Sulfur	--	--	79,256	A
Atmos. Oxygen	--	--	118,521	B
Water	--	--	44,393	C

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 242,170

2. Product Weight (lbs/hr): 241,667 as 100% H₂SO₄ (2,900 TPD 100% H₂SO₄) [Note: Combined production rate of No. 8 and No. 9 H₂SO₄ plants will not exceed 5,700 TPD (475,000 lb/hr)]

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission ¹		Allowed ² Emission Rate per Rule 17-2	Allowable ³ Emission lbs/hr	Potential ⁴ Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Sulfur	483.3	2,117.0	4.0 lb/ton	483.3	483.3	2,117.0	D
dioxide							
Sulfuric	18.1	79.4	0.15 lb/ton	18.1	18.1	79.4	D
acid mist							
NO _x	14.5*	63.5	NA	NA	14.5	63.5	D

*Estimated actual emissions based on test data from another plant.

¹See Section V, Item 2.

²Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

³Calculated from operating rate and applicable standard.

⁴Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
<i>Final Converter</i>	<i>Sulfur dioxide</i>	<i>99.7+</i>	<i>N/A</i>	<i>AP-42</i>
<i>Final Absorber/Mist</i>	<i>Acid Mist</i>	<i>99+</i>	<i>>1 micron</i>	<i>AP-42</i>
<i>Eliminator</i>				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
<i>Not Applicable</i>			

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, others--lbs/hr.

Fuel Analysis:

Percent Sulfur: _____ Percent Ash: _____

Density: _____ lbs/gal Typical Percent Nitrogen: _____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution): _____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average Not applicable Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

Cooling tower and boiler blowdown will be discharged to plant recirculation system or to the NPDES outfalls.

No. 8 Sulfuric Acid Plant

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 149.5 ft. Stack Diameter: 8.0 ft.
 Gas Flow Rate: 153,700 ACFM 133,000 DSCFM Gas Exit Temperature: 150 °F.
 Water Vapor Content: 0 % Velocity: 51.0 FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type O (Plastics)	Type II (Rubbish)	Type III (Refuse)	Type IV (Garbage)	Type IV (Pathological)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume (ft) ³	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control devices: Cyclone Wet Scrubber Afterburner
 Other (specify) _____

Brief description of operating characteristics of control devices: _____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)].
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods, 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8 ½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
7. An 8 ½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Examples: Copy of relevant portion of USGS topographic map).
8. An 8 ½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

Yes No

Contaminant	Rate or Concentration
<u>Sulfur dioxide</u>	<u>4.0 lb/ton</u>
<u>Sulfuric acid mist</u>	<u>0.15 lb/ton</u>

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

Yes No

Contaminant	Rate or Concentration
<u>Sulfur dioxide</u>	<u>4.0 lb/ton</u>
<u>Sulfuric acid mist</u>	<u>0.15 lb/ton</u>

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
<u>Sulfur dioxide</u>	<u>4.0 lb/ton</u>
<u>Sulfuric acid mist</u>	<u>0.15 lb/ton</u>

D. Describe the existing control and treatment technology (if any). *See PSD report*

- | | |
|---------------------------|--------------------------|
| 1. Control Device/System: | 2. Operating Principles: |
| 3. Efficiency:* | 4. Capital Costs: |

*Explain method of determining

- 5. Useful Life:
- 7. Energy:
- 9. Emissions:

- 6. Operating Costs:
- 8. Maintenance Cost:

Contaminant	Rate or Concentration

10. Stack Parameters

- a. Height: ft.
- b. Diameter: ft.
- c. Flow Rate: ACFM
- d. Temperature: °F.
- e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See PSD report

1.

- a. Control Devices:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:
- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:
- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

- a. Control Device:
- b. Operating Principles:
- c. Efficiency:¹
- d. Capital Cost:
- e. Useful Life:
- f. Operating Cost:
- g. Energy:²
- h. Maintenance Cost:
- i. Availability of construction materials and process chemicals:
- j. Applicability to manufacturing processes:
- k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: *See PSD report*

- 1. Control Device:
- 2. Efficiency:¹
- 3. Capital Cost:
- 4. Useful Life:
- 5. Operating Cost:
- 6. Energy:²
- 7. Maintenance Cost:
- 8. Manufacturer:
- 9. Other locations where employed on similar processes:
 - a. (1) Company:
 - (2) Mailing Address:
 - (3) City:
 - (4) State:

¹Explain method of determining efficiency.

²Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

(8) Process Rate:¹

b. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:¹

Contaminant

Rate or Concentration

Contaminant	Rate or Concentration

(8) Process Rate:¹

10. Reason for selection and description of systems: *See PSD report*

¹Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION
See PSD report for No. 9 H₂SO₄ Plant

A. Company Monitored Data

1. _____ no. sites _____ TSP _____ () SO₂* _____ Wind spd/dir

Period of Monitoring _____ / _____ / _____ to _____ / _____ / _____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

- a. Was instrumentation EPA referenced or its equivalent? Yes No
- b. Was instrumentation calibrated in accordance with Department procedures?
 Yes No Unknown

B. Meteorological Data Used for Air Quality Modeling

- 1. _____ Year(s) of data from _____ / _____ / _____ to _____ / _____ / _____
month day year month day year
- 2. Surface data obtained from (location) _____
- 3. Upper air (mixing height) data obtained from (location) _____
- 4. Stability wind rose (STAR) data obtained from (location) _____

C. Computer Models Used

- 1. _____ Modified? If yes, attach description.
- 2. _____ Modified? If yes, attach description.
- 3. _____ Modified? If yes, attach description.
- 4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	_____ grams/sec
SO ²	_____ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

- F. Attach all other information supportive to the PSD review.
- G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e, jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.
- H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

Table 2-1. Current and Proposed Permit Limitations for No. 8 and No. 9 Sulfuric Acid Plants, Cargill Fertilizer, Inc. (Revised 3/20/94)

	No. 8 H ₂ SO ₄	No. 9 H ₂ SO ₄	No. 8 and No. 9 H ₂ SO ₄ Plants Combined
<u>Current Limitations</u>			
Production Rate (100% H ₂ SO ₄)	2,500 TPD	2,800 TPD	5,300 TPD
SO ₂ Emissions	4.0 lb/ton ^a	4.0 lb/ton ^a	—
	416.67 lb/hr ^b	433.2 lb/hr ^c	849.87 lb/hr ^b
H ₂ SO ₄ Mist Emissions	0.15 lb/ton ^a	0.15 lb/ton ^a	—
	15.63 lb/hr ^b	16.2 lb/hr	31.83 lb/hr ^b
<u>Proposed Limitations</u>			
Production Rate (100% H ₂ SO ₄)	2,900 TPD	3,200 TPD	5,700 TPD
SO ₂ Emissions	4.0 lb/ton ^a	4.0 lb/ton ^a	—
	11,600 lb/day	12,800 lb/day	22,800 lb/day
	483.33 lb/hr ^b	533.33 lb/hr ^b	950.0 lb/hr ^b
	2,117 TPY	2,336 TPY	4,161 TPY
H ₂ SO ₄ Mist Emissions	0.15 lb/ton ^a	0.15 lb/ton ^a	—
	435 lb/day	480 lb/day	855 lb/day
	18.1 lb/hr ^b	20.0 lb/hr ^b	35.6 lb/hr ^b
	79.4 TPY	87.6 TPY	156.0 TPY

Note: lb/day = pounds per day
 lb/hr = pounds per hour
 lb/ton = pounds per ton
 H₂SO₄ = sulfuric acid
 % = percent
 SO₂ = sulfur dioxide
 TPD = tons per day
 TPY = tons per year

^a lb/ton of 100% H₂SO₄.

^b 3-hour average.

^c Based on 2,600 TPD (108.33 TPH) production rate.

Table 2-2. Stack Parameters for Existing and Expanded No. 9 H₂SO₄ Plant (Revised 3/20/94)

Plant	Maximum H ₂ SO ₄ Production Rate ^a (TPH)	Stack Height (ft)	Stack Diameter (ft)	Gas Flow Rate (acfm)	Gas Velocity (fps)	Gas Temperature (°F)
<u>Existing Conditions</u>						
No. 8 H ₂ SO ₄	2,500	149.5	8.0	132,500	43.9	150
No. 9 H ₂ SO ₄	2,800 ^b	149.5	9.0	128,900	33.8	170
<u>Future Conditions</u>						
No. 8 H ₂ SO ₄	2,900	149.5	8.0	153,700	51.0	150
No. 9 H ₂ SO ₄	3,200	149.5	9.0	158,600	41.6	170

Note: acfm = actual cubic feet per minute.
 °F = degrees fahrenheit.
 fps = feet per second.
 ft = feet.
 H₂SO₄ = sulfuric acid.
 TPD = tons per day.
 TPH = tons per hour.

^a As 100% H₂SO₄.

^b Lower production rate of 2,600 TPD was used to reflect conservative gas flow rate (maximum permitted rate is 2,800 TPD).

Table 2-3. Estimated Maximum NO_x Emissions From No. 8 and No. 9 Sulfuric Acid Plants
(Revised 3/20/94)

Plant	H ₂ SO ₄ Production Rate (TPD)	NO _x Emissions	
		lb/hr	TPY
<u>Current Emissions</u>			
H ₂ SO ₄ No. 8	2,500	12.5	54.8
H ₂ SO ₄ No. 9	2,800	14.0	61.3
<u>Proposed Emissions</u>			
H ₂ SO ₄ No. 8	2,900	14.5	63.5
H ₂ SO ₄ No. 9	3,200	16.0	70.1
No. 8 and No. 9 Combined	5,700	28.5	124.8

Note: NO_x emissions based on emission factor of 0.12 lb/ton.
 lb/hr = pounds per hour.
 TPD = tons per day.
 TPY = tons per year.

Table 3-3. PSD Source Applicability Analysis, Cargill No. 8 and No. 9 Sulfuric Acid Plant Expansion (Revised 3/20/94)

Emission Scenario	Emission Rate (TPY)		
	SO ₂	H ₂ SO ₄ Mist	NO _x ^a
<u>Current Allowable Emissions</u>			
No. 8 H ₂ SO ₄	1,825	68.5	54.8
No. 9 H ₂ SO ₄	1,897	71.0	61.3
<u>Proposed Allowable Emissions</u>			
No. 8 and No. 9 H ₂ SO ₄ @ 5,700 TPD Total	4,161	156.0	124.8
Total Net Increase	439	16.5	8.7
PSD Significant Emission Rate	40	7	40

Note: H₂SO₄ = sulfuric acid.
 NO_x = nitrogen oxides.
 PSD = prevention of significant deterioration.
 SO₂ = sulfur dioxide.
 TPD = tons per day.
 TPY = tons per year.

^a Not an allowable emission rate; estimate of actual emissions.

Table 3-5. PSD Increment Consumption Baseline and Future SO₂ Emissions, Cargill Fertilizer, Inc. (Revised 3/20/94)

Emission Scenario	SO ₂ Emissions (TPY)	Basis
<u>Baseline Emissions^a</u>		
No. 4 H ₂ SO ₄	1,276	274 TPD; 6,992 lb SO ₂ /day
No. 5 H ₂ SO ₄	2,216	475 TPD; 12,140 lb SO ₂ /day
No. 6 H ₂ SO ₄	3,029	650 TPD; 16,598 lb SO ₂ /day
No. 7 H ₂ SO ₄	2,519	1,380 TPD; 10 lb/ton
No. 8 H ₂ SO ₄	3,256	1,784 TPD; 10 lb/ton
No. 9 H ₂ SO ₄	<u>1,898</u>	2,600 TPD; 4 lb/ton
Total	14,194	
<u>Future Emissions</u>		
No. 7 H ₂ SO ₄	1,606	2,200 TPD; 4 lb/ton
No. 8/No. 9 H ₂ SO ₄ Combined	<u>4,161</u>	5,700 TPD; 4 lb/ton
Total	5,767	
<u>Net Change</u>	-8,427	

Note: H₂SO₄ = sulfuric acid.
 lb/ton = pounds per ton.
 PSD = prevention of significant deterioration.
 SO₂ = sulfur dioxide.
 TPD = tons per day.
 TPY = tons per year.

^a Nos. 4, 5, 6

Allowable rates for short-term, actual emissions over last 2 years of operation (1975-76) are 892; 1,773; and 2,469 TPY, respectively.

Nos. 7, 8, 9

Represents allowable SO₂ emissions as of January 6, 1975, representative of construction permits issued in November 1974.

ATTACHMENT D
CLASS I ANALYSIS MODEL PRINTOUTS
(Provided Under Separate Cover)