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

December 13, 1985

Ms. Patricia A. Brooks
Environmental Assessment Branch
U.S. Environmental Protection Agency
345 Courtland Street
Atlanta, Georgia 30365

Dear Ms. Brooks:

RE: Proposed Pine Level Mine; Amax Chemical Corporation; Revised draft EIS technical information documents covering: Section 3, Air/Meteorology/Noise; Section 4, Geotechnical Resources; Section 5, Radiation; Section 8, Aquatic Ecology; Section 9, Terrestrial Ecology; Section 10, Socioeconomics.

The department has recieved copies of the above drafts. No comments will be submitted at this time on Sections 4, 5, 8, 9 and 10. Comments on the section 3 are as follows:

Section 3. Air/Meteorology/Noise

S.3.34 The emission standards for the phosphate rock dryer will be determined by BACT for any pollutant emitted in quantities greater than the significant emission rates assuming the dryer will represent a major air pollution facility.

S.3.4 This section should eliminate the reference to the Mississippi Chemical Corporation construction permits since IMC has purchased the property.

S.3.5.2 In order to evaluate compliance with regulations after construction, the bubbler method can not be used to determine the sulfer dioxide concentrations in the ambient PSD.

If you have any questions, I can be contacted at 904/488-0130.

Sincerely,

Mickey D. Bryant

Mickey D. Bryant
Administrator, Certification and
Technical Support Section

MDB/jk

cc: Jack D. Doolittle, ESE
Dan A. Williams
Willard Hanks

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

	Initial	Date
1. TO: (NAME, OFFICE, LOCATION) Willard Hanks		
2.		
3.		
4.		

REMARKS:

INFORMATION

- [ ] Review & Return
- [ ] Review & File
- [ ] Initial & Forward
- [ ]

DISPOSITION

- [ ] Review & Respond
- [ ] Prepare Response
- [ ] For My Signature
- [ ] For Your Signature
- [ ] Let's Discuss
- [ ] Set Up Meeting
- [ ] Investigate & Report
- [ ] Initial & Forward
- [ ] Distribute
- [ ] Concurrence
- [ ] For Processing
- [ ] Initial & Return

FROM: Mulvey Bryant

DATE 12-13-85

PHONE 8-0130

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

FOR ROUTING TO OTHER THAN THE ADDRESSEE

To: _____ Loctn: _____
To: _____ Loctn: _____
To: _____ Loctn: _____
From: _____ Date: _____

TO: Mickey Bryant

FROM: Willard Hanks WH

DATE: November 15, 1985

SUBJECT: AMAX Chemical Corporation

BAQM's general comments on AMAX's EIS for the proposed Pine Level Mine are as follows:

Page 3-16/Section 3.34 - Assuming the phosphate rock dryer will be a major air pollution facility, the emission standards will be established by a best available control technology determination (BACT) for any pollutant emitted in qualities greater than the significant emission rates. The standards will be as strict as the applicable new source performance standards (NSPS). Only when BACT or NSPS does not apply will the general emission standards in Chapter 17-2, FAC, apply to this facility.

Page 3-31/Section 3.5.2 - The specified method to determines the sulfur dioxide concentration in the ambient air PSD to comply with the regulations is not the bubbler method.

Page 3-34/Section 3.5.3 - The Department had not adopted an ambient air sampling method for fluoride.

WH/ps

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO 226

ACTION DUE DATE 11 27

1. TO: (NAME, OFFICE, LOCATION)	
W. Starnes	Initial / Date
2. Bill Thomas 11/13	Initial / Date
3.	Initial / Date
4.	Initial / Date

REMARKS:

Draft comments or Send memo saying we don't have any comments. Coordinate with Brown + Fancy Prepare for your Signature

Need to assign for review & get letter to Bryant & get crossed off action item list.

Clair

INFORMATION

- Review & Return
- Review & File
- Initial & Forward

DISPOSITION

- Review & Respond
- Prepare Response
- For My Signature
- For Your Signature
- Let's Discuss
- Set Up Meeting
- Investigate & Report
- Initial & Forward
- Distribute
- Concurrence
- For Processing
- Initial & Return

FROM:

DATE 11-85

PHONE

DEPARTMENT OF ENVIRONMENTAL REGULATION

ROUTING AND TRANSMITTAL SLIP

ACTION NO

ACTION DUE DATE

1. TO: (NAME, OFFICE, LOCATION) Steve Smallwood	Initial	
	Date	
2.	Initial	
	Date	
3.	Initial	
	Date	
4.	Initial	
	Date	

REMARKS:

Please review + Comment - note deadline.

INFORMATION	
	Review & Return
	Review & File
	Initial & Forward

DISPOSITION	
	Review & Respond
	Prepare Response
	For My Signature
	For Your Signature
	Let's Discuss
	Set Up Meeting
	Investigate & Report
	Initial & Forward
	Distribute
	Concurrence
	For Processing
	Initial & Return

FROM: Mickey Bryant

DATE 10-30-85

PHONE 8-0130

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices
And/Or To Other Than The Addressee

To: _____ Loctn.: _____
To: _____ Loctn.: _____
To: _____ Loctn.: _____
From: _____ Date: 10-31-85

Reply Optional [ ] Reply Required [ ] Info. Only [ ]
Date Due: _____ Date Due: NOV 1 1985

BAQM

TO: Dan Williams
Bob Stetler
Catherine Wanat
Landon Ross
Roxane Dow
Rodney DeHan
✓ Steve Smallwood 3
J. P. Subramani
Tim Lynch

FROM: Mickey Bryant

DATE: October 31, 1985

SUBJECT: Amax Chemical Corporation; Proposed Pine Level Mine; Revised draft EIS technical information documents covering: Section 3, Air/Meteorology/Noise; Section 4, Geotechnical Resources; Section 5, Radiation; Section 8, Aquatic Ecology; Section 9, Terrestrial Ecology; and Section 10, Socioeconomics.

All or some of the above draft revised sections of the EIS are attached for your review and comment. Please respond by November 29, 1985. If I have not received written comments by December 3, I will assume you do not plan to submit any comments. Thank you for your assistance.

MDB/jk

Attachment

cc: Jack D. Doolittle, ESE
Patricia Brooks, EPA

DRAFT ENVIRONMENTAL IMPACT STATEMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
RESOURCE DOCUMENT (BASELINE SECTION)
SECTION 3
AIR QUALITY/METEOROLOGY/NOISE

AMAX CHEMICAL CORPORATION
PINE LEVEL MINE

Manatee and DeSoto Counties, Florida

Prepared by:

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.
Gainesville, Florida

78-095-0851-0120

October 1985

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

3.0 AIR QUALITY/METEOROLOGY/NOISE

3.1 INTRODUCTION

The proposed mine, beneficiation plant, and rock drying facility will be located in the remote southeastern corner of Manatee County and the northwestern portion of DeSoto County. The proposed activities have the potential to contribute to air emissions during the initial construction period as well as during the approximate 30-year life of the mining operation. Construction emissions will consist primarily of fugitive particulate matter. Minor vehicular emissions (carbon monoxide, nitrogen oxides, hydrocarbons, particulate matter, and sulfur dioxide) will also occur.

Operating emissions will be primarily related to the phosphate rock drying and handling operations, but may also include fugitive dust emissions from land clearing and reclamation activities associated with mining. Particulate matter will be the primary contribution to the air emissions. Other pollutants emitted will include sulfur dioxide, nitrogen oxides, carbon monoxide, and hydrocarbons from combustion of fossil fuel, and fluoride emissions generated from the rock drying operation.

A Plan of Study (POS) for the AMAX Chemical Corporation Environmental Impact Statement (EIS) was approved by U.S. Environmental Protection Agency (EPA), Region IV, in December 1978. This plan did not include an ambient air monitoring program for the Pine Level project since only the mining operations were to be conducted at the Pine Level site, with rock drying to be conducted at the Port Manatee site. Since the Pine Level site area is remote, preconstruction ambient air monitoring was not considered necessary. In February 1980, EPA concluded that ambient air monitoring at the Pine Level site was not necessary to fulfill Prevention of Significant Deterioration (PSD) preconstruction monitoring requirements (Williams, 1980).

An addendum to the POS was prepared in December 1979 in response to changing conditions. AMAX had acquired additional lands at the Pine Level mine site, the mine site was being considered for location of the rock dryer (originally planned for Port Manatee), and revised federal PSD regulations had been proposed (Federal Register, Vol. 44, No. 173, September 5, 1979) which could alter preconstruction ambient air monitoring requirements. In response to these changes and anticipated requirements, AMAX began an ambient air monitoring program at the Pine Level site in March 1979. Additional air quality data were gathered by other private firms commencing in 1977, and this information became available as part of AMAX's acquisition of additional lands.

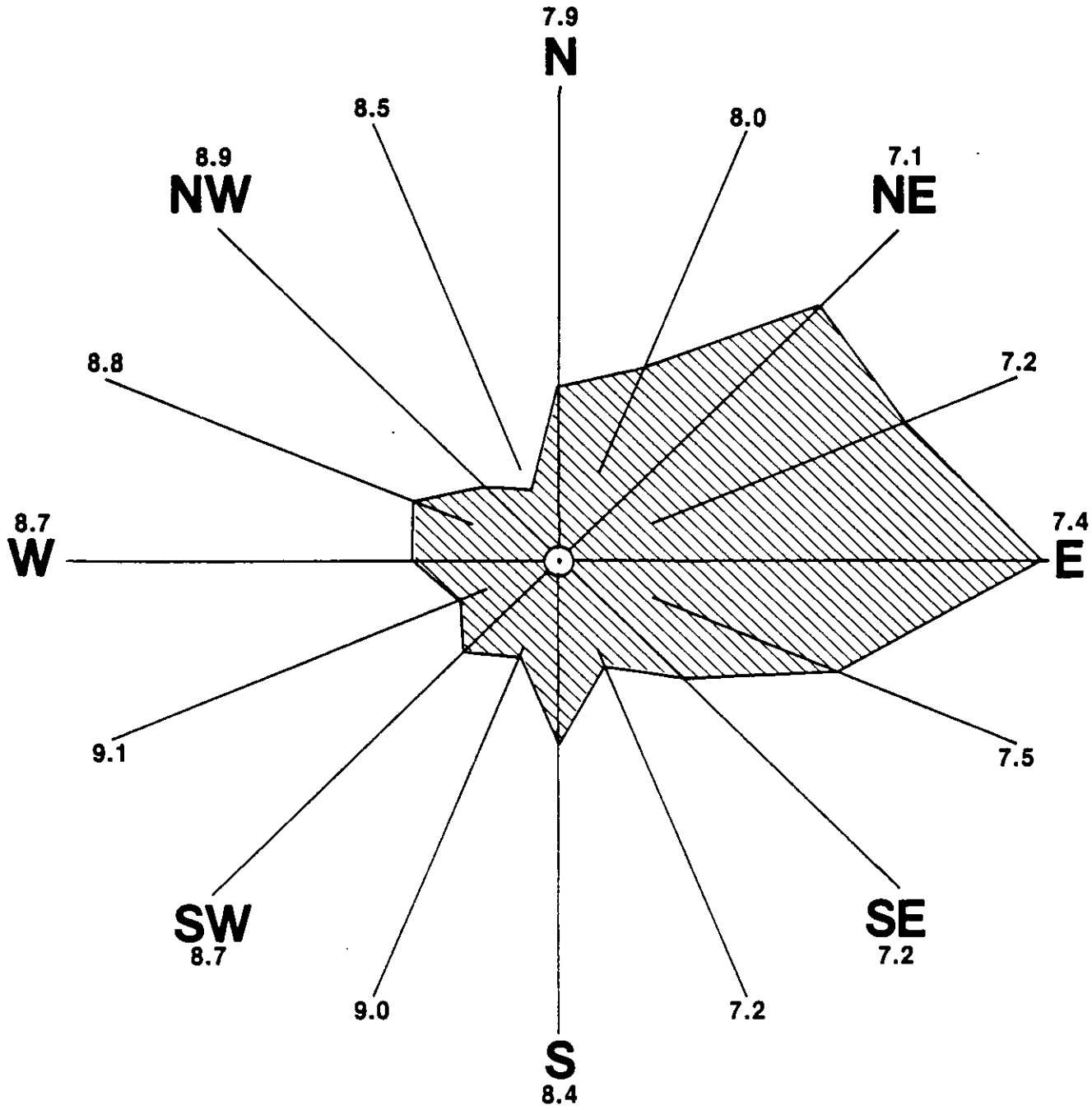
This Air Baseline Section presents a description of the local meteorology of the site area, applicable air quality regulations, existing and known planned emission sources which may impact the site area, and air quality measurements obtained at the AMAX site. Based on the gathered information, estimated baseline air quality levels and the status of air quality levels at the site are presented. Baseline noise levels are also presented and are estimated from available literature.

3.2 METEOROLOGY

Because the proposed AMAX site is located about 25 miles from the Gulf of Mexico, temperature extremes are expected to be less moderate than at coastal locations. During the four warmest months (June through September), the average temperature is 81°F and about 60 percent of the yearly rainfall of 55 inches occurs. During the winter quarter, rainfall decreases, and the ambient temperature decreases to an average of 64°F. Rainfall data representative of the AMAX site are presented in Section 7.1, Climatology.

For the proposed site area, the National Weather Service (NWS) Station at Fort Myers was considered to be the most representative weather station for which long-term wind data were available. This station is located about 40 miles south-southeast of the site, 10 miles from the Gulf of Mexico, and 2 miles from the Caloosahatchee River. Data from other NWS stations, such as Tampa and Orlando, are not expected to be representative of site conditions because of the stations' large distances from the site and relative location with respect to the Gulf of Mexico and Atlantic Ocean. The NWS at Tampa is located about 64 miles to the northwest of the site and on the coast bordering Tampa Bay. The NWS at Orlando is located about 100 miles to the north-northwest of the site, 36 miles from the Atlantic Ocean and more than 80 miles from the Gulf of Mexico.

Figure 3.2-1 shows a five-year averaged wind rose (1969-1973) for Fort Myers, based on 8 observations per day with average wind speeds indicated for each wind direction. The wind rose displays a predominance of winds from the easterly directions, indicating that emitted pollutants will generally travel towards the west, on an annual basis. The highest wind speeds occur, on the average, from the westerly directions. Higher wind speeds increase the dilution of pollutants, but can also increase the potential for downwash of stack plumes and the generation of fugitive particulate matter emissions. The annual average



CALM = 10.0%
AVERAGE WIND SPEEDS SHOWN IN KNOTS.

SCALE: 0 5%

SOURCE: NATIONAL CLIMATIC CENTER, 1979.

Figure 3.2-1
FIVE YEAR AVERAGED ANNUAL WIND ROSE, FORT MYERS, FLORIDA, 1969-1973

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

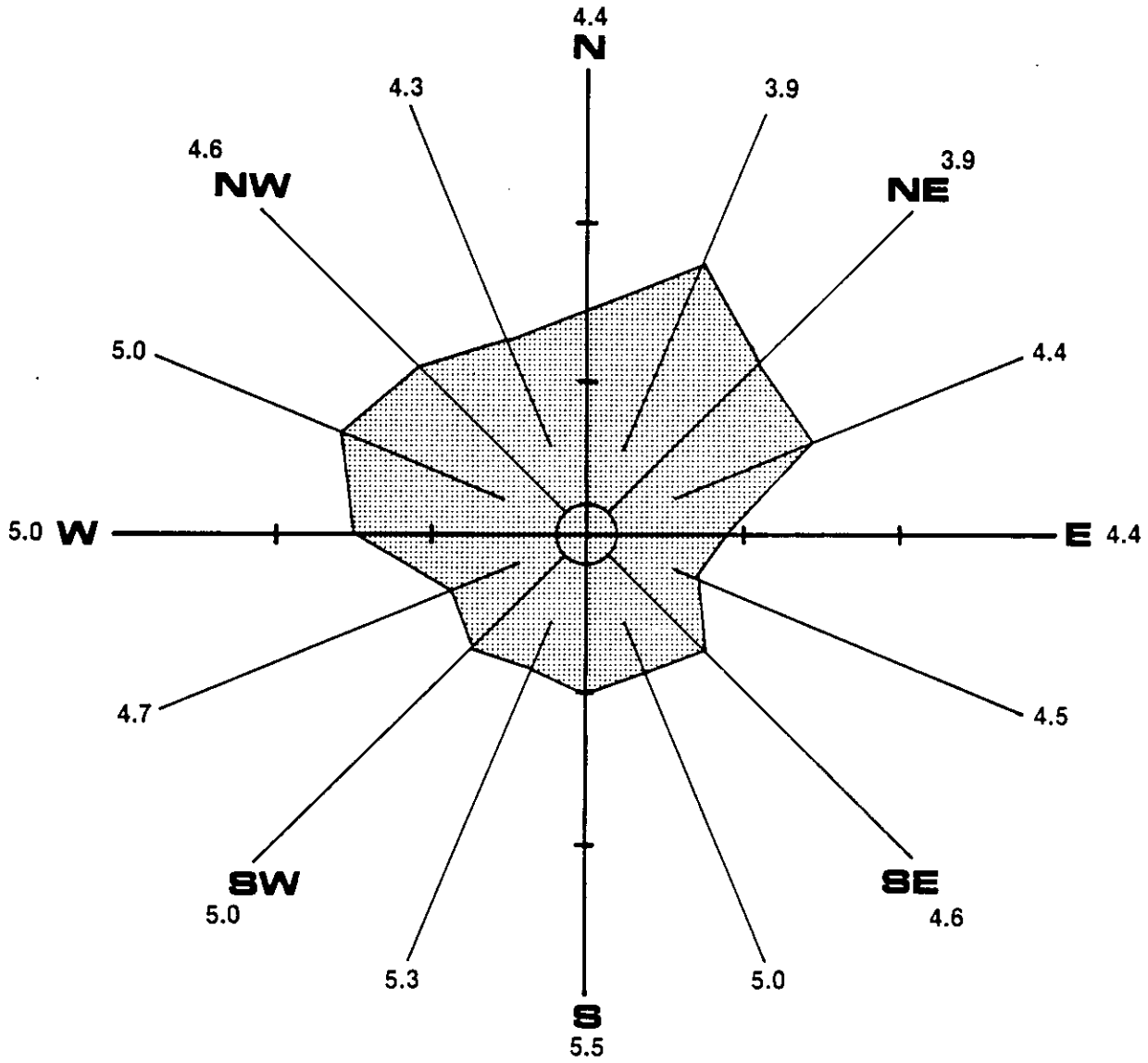
wind speed at Fort Myers is 7.1 knots (3.7 m/sec), and calm conditions, which are reported when there are no valid wind directions and wind speeds are less than 3 knots, occurred about 10.0 percent on an annual average.

ESE collected ambient wind speed and wind direction data at the AMAX Pine Level site, in conjunction with air quality measurements. The annual and quarterly average wind roses for 1980 are shown in Figures 3.2-2 and 3.2-3, respectively. The wind roses for 1980 are presented because they are based on the most complete valid data set collected for one calendar year. As shown in Figure 3.2-2, the predominant annual average wind directions are from the west-northwest and north-northeast. Winds from the west clockwise through east-northeast are almost evenly distributed, ranging in occurrence from 6.7 to 9.4 percent of the time. Other wind directions generally occur 5 percent or less throughout the year. Calm conditions occurred about 33.5 percent of the time during the year.

Compared with the annual average wind rose from Fort Myers, presented in Figure 3.2-1, the annual average wind direction frequencies at the AMAX site are different with a greater occurrence of wind directions from the west-northwest through north-northwest and a lesser occurrence of east and east-southeast wind directions. This difference of wind direction frequencies between the two sites is partly attributable to the collection of data for different time periods and the greater occurrence of calms at the AMAX site compared to Fort Myers data.

The quarterly wind roses for the AMAX site show that the predominant wind directions are from the north-northeast from January to March, east-northeast and west-northwest from April to June, west from July to September, and north-northeast from October to December. For the periods from January to March and July to September, however, the frequencies of the predominant wind directions are generally not significantly greater than most of the other wind directions.

07-22-82



SCALE: 0 5%

CALM = 33.5%

AVERAGE WIND SPEEDS SHOWN IN KNOTS.

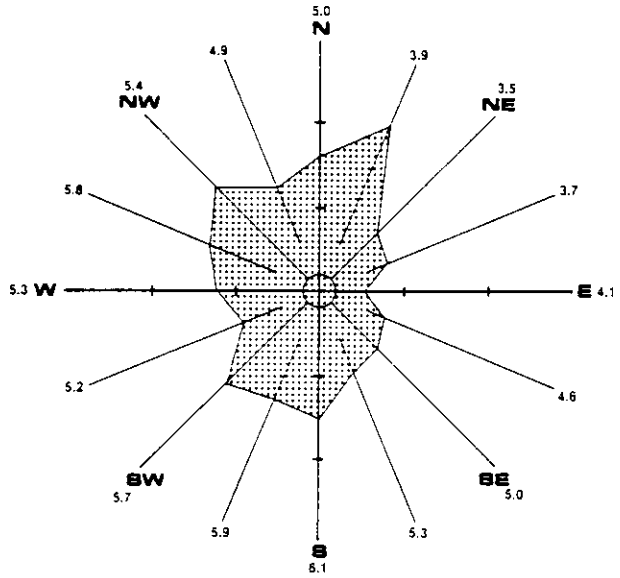
SOURCE: ESE, 1982.

Figure 3.2-2
1980 ANNUAL AVERAGE WIND ROSE AT THE AMAX SITE

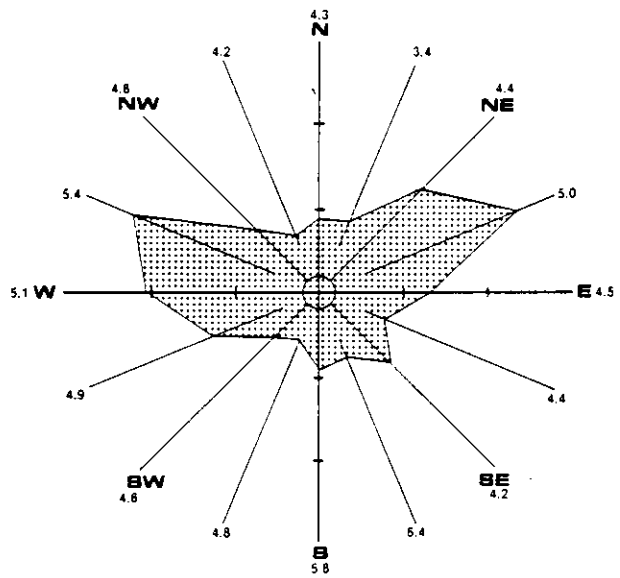
U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

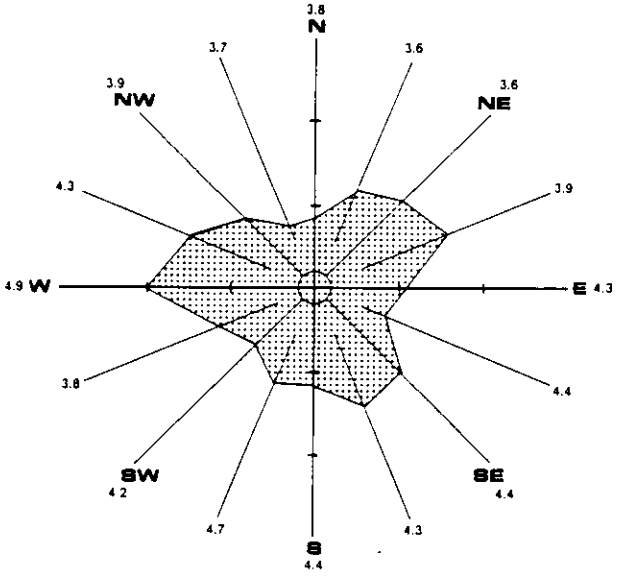
07-22-82



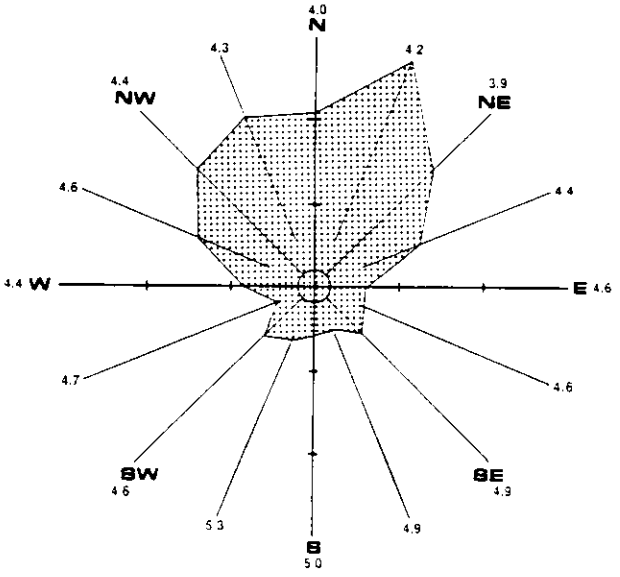
January to March
Calm = 29.9%



April to June
Calm = 35.2%



July to September
Calm = 38.6%



October to December
Calm = 30.7%

SCALE: 0 5%

SOURCE: ESE, 1982.

AVERAGE WIND SPEEDS SHOWN IN KNOTS.

Figure 3.2-3
1980 QUARTERLY AVERAGE WIND ROSES AT THE AMAX SITE

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

Atmospheric stability, as determined by the method of Turner (1964), is a measure of the dispersive capacity of the atmosphere. Stability classes range generally from A to F, with Class A representing the most unstable case, and Class F the most stable. As the atmosphere becomes more unstable, the dispersive capacity of the atmosphere increases, thus greatest dispersion occurs under stability Class A. The relative frequency of occurrence of each stability class, based upon the Fort Myers five-year data (1969-1973), is presented in the following list:

Stability Class	Frequency of Occurrence
A - Unstable	0.7%
B - Moderately Unstable	6.6%
C - Slightly Unstable	14.9%
D - Neutral	32.5% } 77.9%
E,F - Slightly Stable, Stable	45.4% }

As indicated, the neutral and stable stabilities occur most frequently in Fort Myers. Calm conditions occur about 10 percent of the time and occur most frequently for the stable stabilities. Meteorological conditions at the AMAX site are expected to be similar to the conditions experienced at Fort Myers, due to the proximity of the two sites. However, because of the more inland location of the AMAX site, a slight increase in the unstable stability categories (A, B, C) and slightly lower wind speeds would be expected at the site as compared to Fort Myers. The difference in wind speeds between the two sites is shown in the wind roses (Figures 3.2-1 through 3.2-3) where the average wind speed for each wind direction is given. The meteorological data collected at the NWS at Fort Myers is considered to be the most representative, available data for predicting the atmospheric transport and dispersion of emissions from the proposed site using air quality models.

Atmospheric temperature inversions alter the dispersive and mixing capacity of the atmosphere and limit the volume of air into which

emitted pollutants can mix. The most frequent inversions occurring at the site are due to the radiative cooling of the surface on clear and calm nights, called nocturnal or radiation inversions. The most severe radiation inversions occur during the fall and winter, but are usually dissolved by surface heating shortly after sunrise.

Other types of inversions that occur at the site are due to frontal systems and subsidence inversions. A frontal system may cause a build-up of pollutant concentrations for a few hours but is experienced infrequently and only during the late fall or winter when cooler air masses invade the state. A subsidence inversion is formed when a stationary high pressure area causes air at high levels to slowly descend, creating an upper air inversion. Unlike nocturnal inversions which are broken up by sunshine, subsidence inversions, as resulting from high pressure areas, may persist for days. A study by Holzworth (1972) showed that occurrences of mixing heights of less than 1,500 meters on at least two to five consecutive days with wind speeds of less than 4.0 meters per second, representative of stagnation conditions, are expected infrequently near the site. These conditions occurred about 9 times over a 5-year period based on data collected at Tampa, the nearest NWS station to the proposed site which was included in the Holzworth study.

3.3 APPLICABLE AIR QUALITY REGULATIONS

3.3.1 AMBIENT AIR QUALITY STANDARDS (AAQS)

Federal and State of Florida AAQS applicable to the proposed project site are shown in Table 3.3-1. Pollutants for which AAQS have been set are termed "criteria" pollutants. Federal AAQS were set by EPA to protect the public health and welfare (i.e., animals, vegetation, soils, materials, etc.) with an adequate margin of safety.

Florida's AAQS are equal to, or in the case of sulfur dioxide, more stringent than the federal AAQS. EPA promulgated secondary annual and

Table 3.3-1. Federal and State of Florida AAQS and Allowable PSD Increments (ug/m^3)

Pollutant	Averaging Time	Federal AAQS		State of Florida AAQS	PSD Increment Class		
		Primary Standard	Secondary Standard		I	II	III
Suspended Particulate Matter	Annual Geometric Mean	75	60	60	5	19	37
	24-Hour Maximum*	260	150	150	10	37	75
Sulfur Dioxide	Annual Arithmetic Mean	80	N/A	60	2	20	40
	24-Hour Maximum*	365	N/A	260	5	91	182
	3-Hour Maximum*	N/A	1,300	1,300	25	512	700
Carbon Monoxide	8-Hour Maximum*	10,000	10,000	10,000	—	—	—
	1-Hour Maximum*	40,000	40,000	40,000	—	—	—
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	—	—	—
Ozone	1-Hour Maximum†	235	235	235	—	—	—
Lead	Calendar Quarter	1.5	1.5	1.5	—	—	—

* Maximum concentration not to be exceeded more than once per year.
† Maximum concentration not to be exceeded on an average of more than one day per year.

Sources: EPA, 1984 (40 CFR, Part 50).
EPA, 1984 (40 CFR, Part 52).
DER, 1983 (Ch 17-2, FAC).

24-hour sulfur dioxide AAQS in 1971, but revoked these standards in 1973. The State of Florida, however, retained these secondary standards as the state AAQS.

3.3.2 PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The Clean Air Act of the United States was amended in August 1977 to incorporate provisions for PSD. Final PSD regulations were promulgated by EPA on August 7, 1980. The regulations divide areas of the country into Class I (certain national parks and national wilderness areas) and Class II (the remainder of the country). Each class is limited in the pollution increases of sulfur dioxide and particulate matter concentrations which can occur within its boundaries as judged against a defined "baseline" concentration level. These allowable increases are termed "increments" (Table 3.3-1), and are much less than the corresponding AAQS, particularly for Class I areas. Class III areas are provided for under the Clean Air Act, but to date no areas of the country have been redesignated to Class III.

Major new sources and major modifications are required to undergo PSD review, which may include a control technology review, source impact analysis, and continuous ambient air quality monitoring. A new source is termed major if it has the potential to emit 100 tons per year or more of any regulated pollutant and belongs to one of 28 specified source categories, or if it has the potential to emit 250 tons per year or more of any regulated pollutant. Major new sources are required to undergo PSD review for each regulated pollutant emitted in significant amounts (Table 3.3-2).

The proposed AMAX phosphate facility is classified in one of the 28 specified source categories (phosphate rock processing plants), and therefore will be a major new source if the facility emits more than 100 tons per year of any pollutant listed in Table 3.3-2. PSD review will be required for each pollutant emitted in significant amounts. The PSD de minimus air quality impact levels are shown in Table 3.3-2. If

Table 3.3-2. PSD Significant Emission Rates and De Minimis Impact Levels

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Air Quality Impact (ug/m^3)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter	NAAQS, NSPS	25	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, Annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY†
Lead	NAAQS	0.6	0.1, 24-hour
Sulfuric Acid Mist	NSPS	7	*
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.04, 1-hour
Asbestos	NESHAP	0.007	*
Beryllium	NESHAP	0.0004	0.0005, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour
Benzene	NESHAP	0	*
Radionuclides	NESHAP	0	*
Inorganic Arsenic	NESHAP	0	*
Any Regulated Pollutant	--	Class I Impact**	

* No ambient measurement method.
† Increase in VOC emissions.
** Any emission rate for a source located within 10 km of a Class I area and causing impacts of 1 ug/m^3, 24-hour average, or greater.

Notes: NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
In February 1981, the Ambient Monitoring Guidelines for PSD (EPA-450/4-80-012) were revised to reflect the following changes in the de minimis levels: lead--0.1 ug/m^3, calendar quarter; hydrogen sulfide--0.2 ug/m^3, 1-hour; and beryllium--0.001 ug/m^3, 24-hour. These revisions have not been published in the Federal Register or incorporated into the Code of Federal Regulations.

Sources: EPA, 1984 (40 CFR 52.21).
DER, 1983 (Ch 17-2, FAC).

the new source's air quality impact is below these levels for any pollutant, EPA, or delegated administering authority, may exempt the ambient monitoring requirements for the source on a pollutant specific basis.

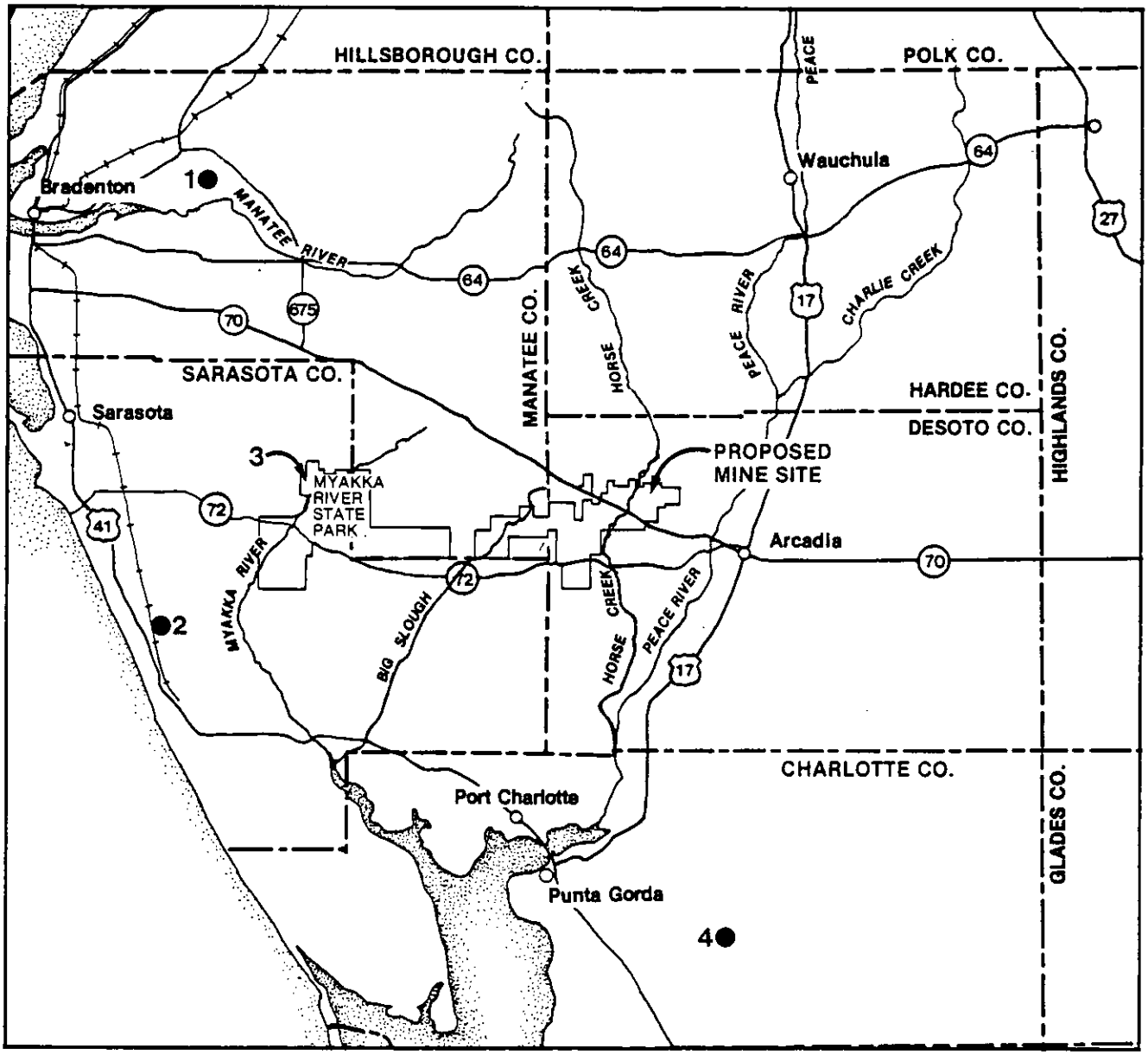
Currently, the Florida DER has administrative and technical review authority for the federal PSD new source review program. PSD applications are submitted through the DER, and this agency conducts the technical review and issues the preliminary determination. Under this delegation, the EPA can comment on the application during the public comment period and must sign off on the permit. It is anticipated that in the near future, Florida DER will be delegated full PSD authority, whereupon, DER will issue the PSD permit.

The proposed site and all areas within 160 km of the site are currently classified as Class II for PSD. Major areas located within 50 km of the site and designated for public use are shown in Figure 3.3-1. These areas include the Myakka River State Park and the Lake Manatee Recreation area. The nearest Class I areas to the site are the Chassahowitzka Wilderness Area and the Everglades National Park, both located about 160 km from the proposed site.

3.3.3 NONATTAINMENT AREAS

EPA has promulgated (EPA, 1981, 40 CFR, Part 81) a list of areas of the country which are not currently meeting Federal AAQS. These areas are termed nonattainment areas, and special stringent permitting conditions are in effect for new sources locating in or significantly impacting these areas. The nearest nonattainment areas to the proposed site are in Hillsborough County, the nearest border of which is located about 40 km north. All of Hillsborough County has been designated a nonattainment area for ozone, and a particulate matter nonattainment area exists in the Tampa area (about 70 km north-northwest of the proposed site) (DER, 1983). Significance levels for impacts on nonattainment areas due to emission sources are presented in Table 3.3-3.

07-22-82



KEY

1. LAKE MANATEE STATE RECREATION AREA
2. OSCAR SCHERER STATE RECREATION AREA
3. MYAKKA RIVER STATE PARK
4. CECIL M. WEBB WILDLIFE MANAGEMENT AREA

N

0 10 20 30 40

SCALE IN KILOMETERS

Figure 3.3-1
DESIGNATED PUBLIC USE AREAS LOCATED WITHIN 50 KM OF THE AMAX SITE

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

Table 3.3-3. Significance Levels for Air Quality Impacts

Pollutant	Annual (ug/m3)	24-Hour (ug/m3)	8-Hour (mg/m3)	3-Hour (ug/m3)	1-Hour (mg/m3)
Sulfur Dioxide	1	5	--	25	--
Total Suspended Particulates	1	5	--	--	--
Nitrogen Dioxide	1	--	--	--	--
Carbon Monoxide	--	--	0.5	--	2

Source: EPA, Federal Register, 43 (118), June 19, 1978.

3.3.4 EMISSION STANDARDS

Federal emission standards applicable to the proposed project consist of the New Source Performance Standards (NSPS) for phosphate rock plants (EPA, 1982, 40 CFR, Part 60). NSPS for phosphate rock plants consist of emission and opacity standards for phosphate rock dryers, calciners, grinders, and ground phosphate rock handling and storage systems (see Table 3.3-4).

The State of Florida has adopted the Federal NSPS for phosphate rock plants. Florida's general particulate emission limiting standards [FAC, Chapter 17-2.610(1)] and general visible emission standard [FAC, Chapter 17-2.610(2)] would apply to the proposed AMAX facility. These standards are as follows:

Particulate Matter Standard

Process weights $\leq$ 30 tons per hour: $E = 3.59\ P^{0.62}$

Process weights $>$ 30 tons per hour: $E = 17.31\ P^{0.16}$

Where: E = Allowable emission in pounds per hour.
P = Process weight rate in tons per hour.

Opacity Standard

Less than 20 percent opacity

Florida has also promulagated a general regulation for unconfined emissions of particulate matter [FAC, Chapter 17-2.610(3)], which requires reasonable precautions to be taken by a source in preventing the escape of unconfined particulate matter emissions.

A Best Available Control Technology (BACT) demonstration must be performed for each new major source subject to PSD review. The demonstration must be made for each pollutants emitted in significant quantities (see Table 3.3-2), and includes selection of a control technology and specific emission limits.

Table 3.3-4. New Source Performance Standards for Phosphate Rock Plants*

Facility	Particulate Matter Standard	Opacity Standard
Phosphate rock dryer	0.030 kg/Mg (0.06 lb/ton)	10%
Phosphate rock calciners processing unbeneficiated rock or combinations of beneficiated and unbeneficiated rock	0.12 kg/Mg (0.23 lb/ton)	10%
Phosphate rock calciners processing beneficiated rock	0.055 kg/Mg (0.11 lb/ton)	10%
Phosphate rock grinder	0.006 kg/Mg (0.012 lb/ton)	0%
Ground phosphate rock handling and storage systems	--	0%

* Applicable to dryers, calciners, grinders, and ground rock handling and storage facilities in plants having a production capacity greater than 3.6 megagrams per hour (4.0 tons/hr).

Source: EPA, 1984 (40 CFR 60, Subpart NN).

The proposed new source must meet the more stringent of the emission standards promulgated under federal NSPS or state emission regulations, or those established under BACT review.

3.4 EMISSION SOURCES

Information concerning existing and proposed emission sources in the vicinity of the AMAX site were obtained from several sources: Florida DER Air Pollutant Inventory System (APIS); the National Emissions Data System (NEDS), Florida DER permit files; and various air quality reports, permit applications, and other similar information.

Figures 3.4-1, 3.4-2, and 3.4-3 present the location of the proposed AMAX site in relation to the major (50 tons/year or more) existing point sources for particulate matter, sulfur dioxide, and nitrogen dioxide emissions, respectively. The 50-kilometer (km) radius circle represents the approximate geographic extent of the locations of emission sources which could impact the site as indicated by past dispersion modeling studies for a number of industrial sources (ESE, 1980, 1981; EPA, 1979) and U.S. EPA guidance (EPA-Federal Register, 43 (118), June 19, 1978]. The recommendation by EPA to limit the application of air quality models to a downwind distance of no more than 50 km is primarily due to the model uncertainties of concentration estimates for larger downwind distances.

3.4.1 PARTICULATE MATTER

There are no major existing particulate matter point sources located in the immediate area (about 20-km radius) of the proposed AMAX site. The site is located about 50 km south of the Polk County/Hillsborough County mine district. The only major phosphate plant in this district within 50 km of the site is Gardinier, Inc., located in Polk County. A permitted (i.e., air construction permits approved), but not yet constructed, phosphate rock drying facility is the Estech Duette phosphate plant which is situated about 40 km north of the site. Major sources in Hardee County within 50 km of the site are American Orange and the recently permitted but not yet constructed Mississippi Chemical

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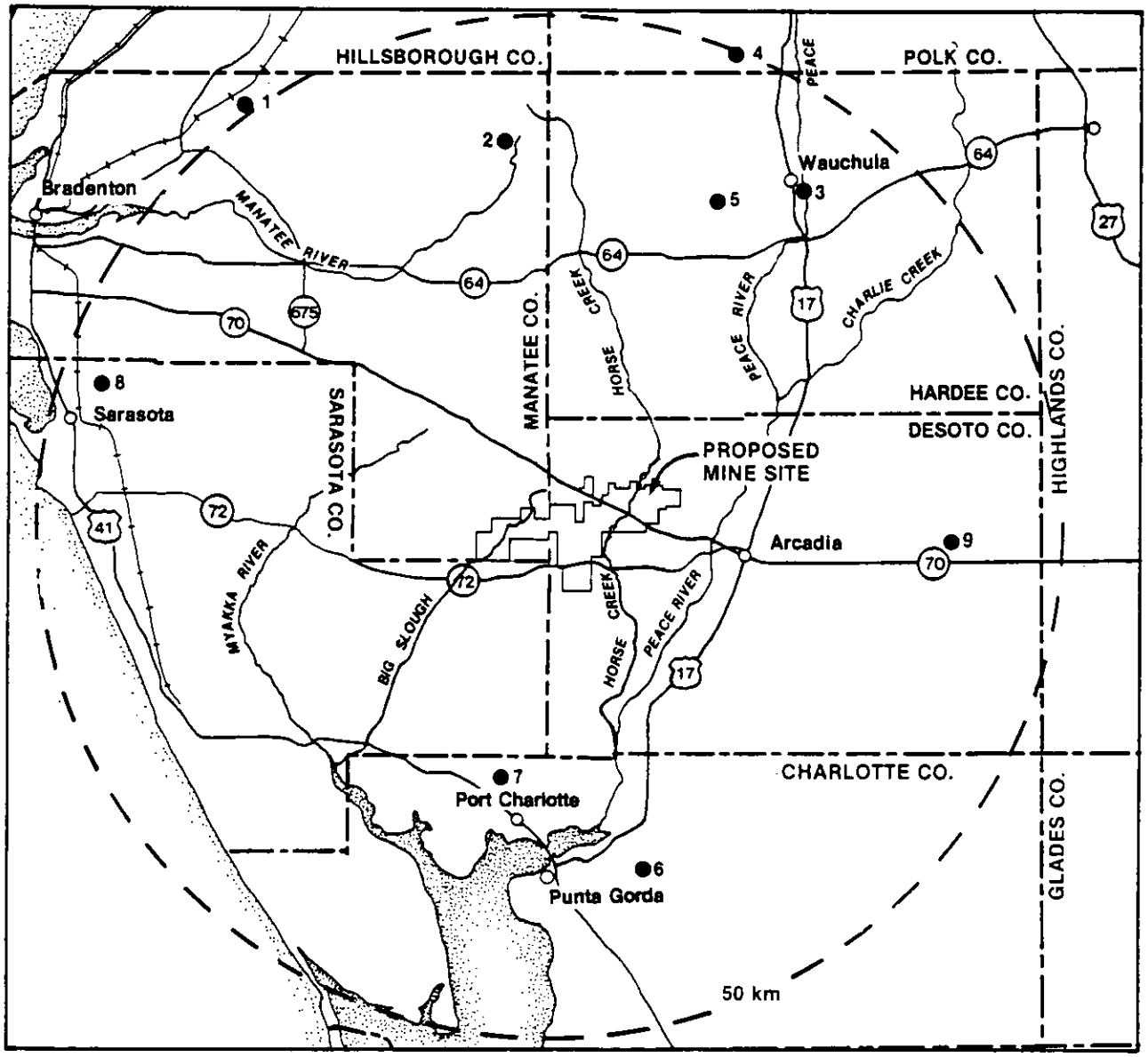


LEGEND

1. FPL-MANATEE
2. ESTECH
3. AMERICAN ORANGE
4. GARDINIER
5. MISSISSIPPI CHEMICAL
6. ASPHALT DEVELOPERS
7. MACASPHALT INC.
8. MACASPHALT INC.
9. AMERICAN ORANGE

0 10 20 30 40

SCALE IN KILOMETERS

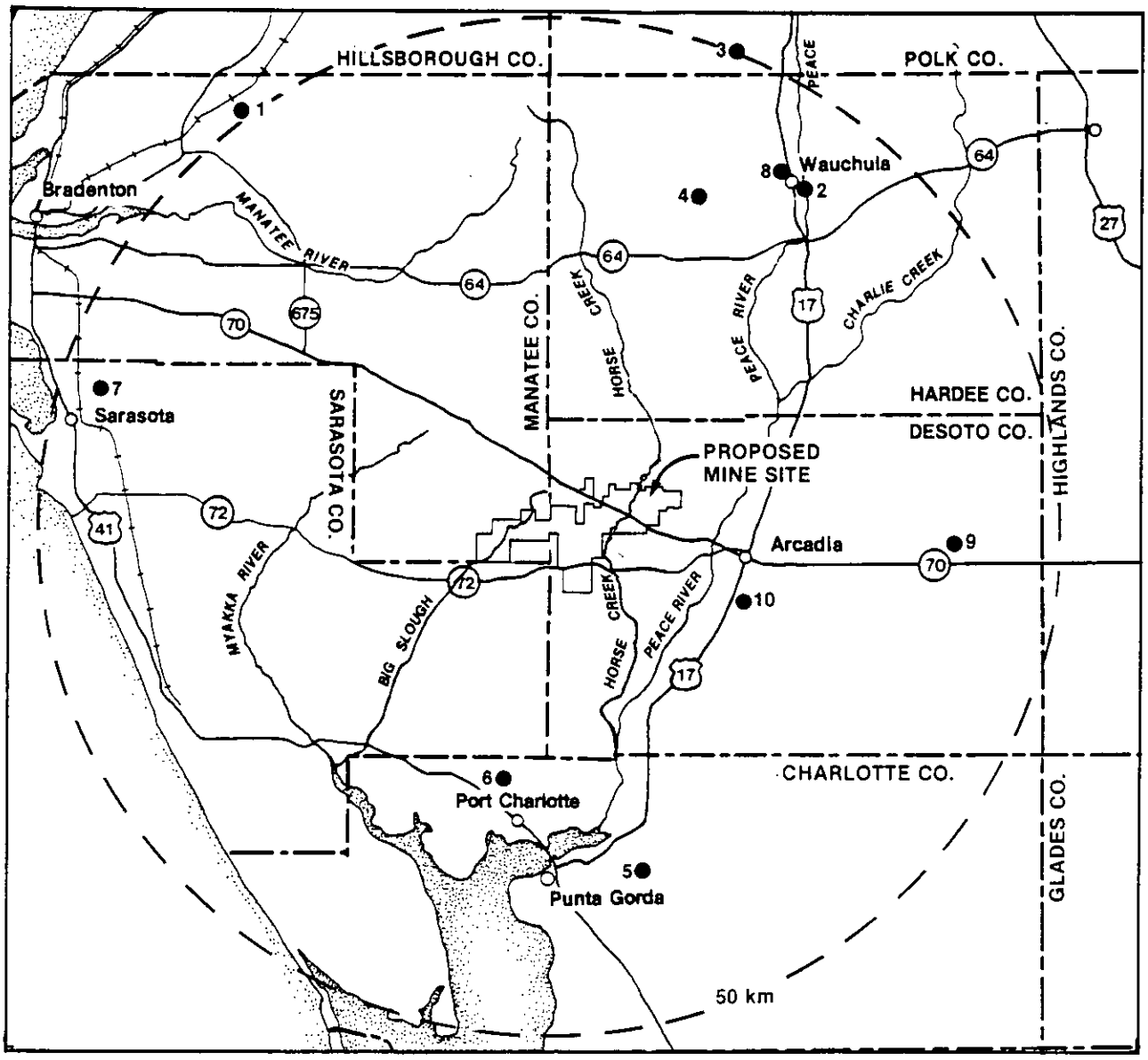
SOURCE: ESE, 1982.

Figure 3.4-1
LOCATIONS OF AMAX PROPOSED MINE SITE AND MAJOR PARTICULATE MATTER EMISSION SOURCES

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

rev. 10-16-85



LEGEND

1. FPL-MANATEE
2. AMERICAN ORANGE
3. GARDINIER
4. MISSISSIPPI CHEMICAL
5. ASPHALT DEVELOPERS
6. MACASPHALT INC.
7. MACASPHALT INC.
8. CITY OF WAUCHULA
9. AMERICAN ORANGE
10. HIGHWAY PAVERS

0 10 20 30 40

SCALE IN KILOMETERS

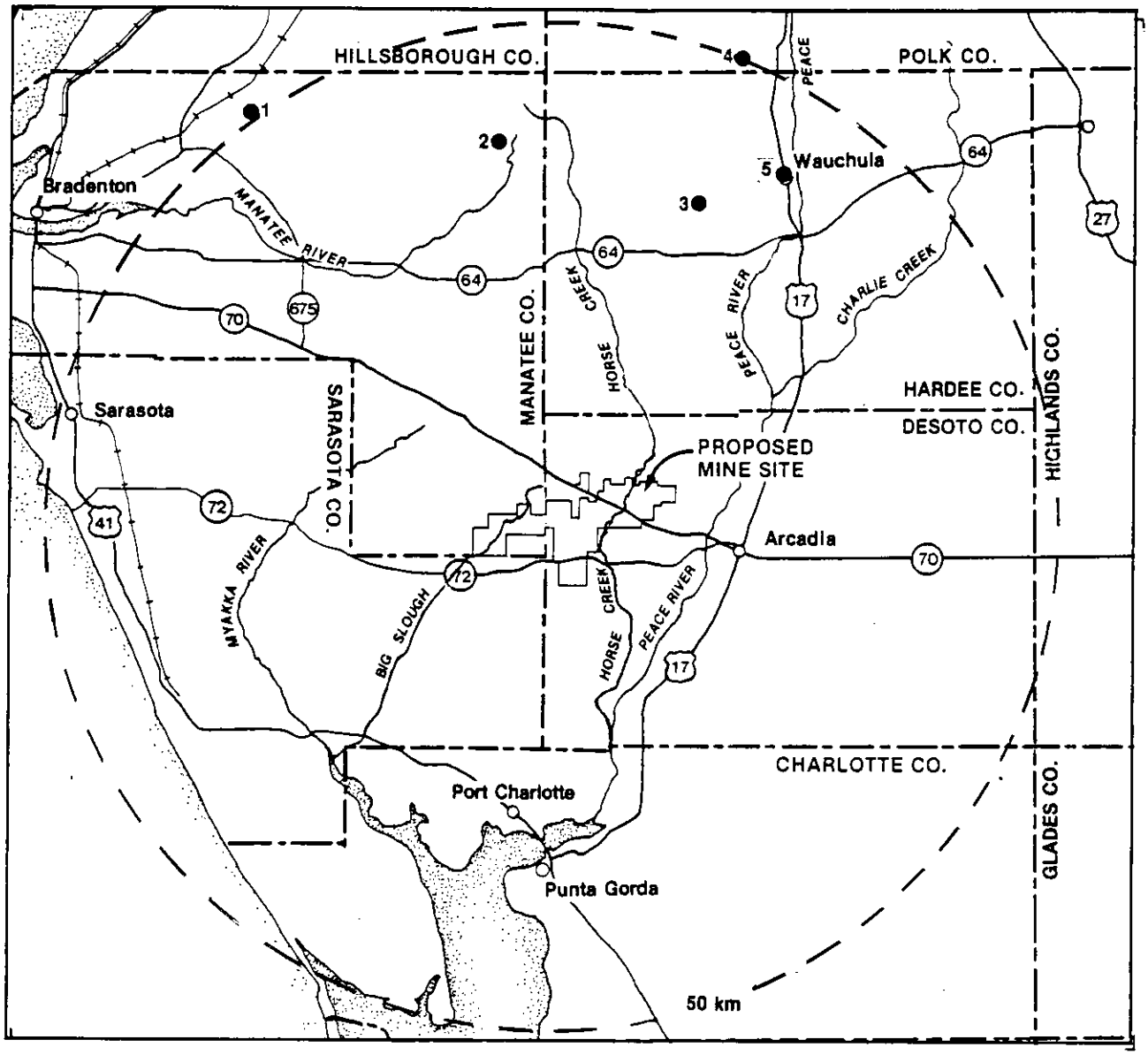
SOURCE: ESE, 1982.

Figure 3.4-2
LOCATION OF AMAX PROPOSED MINE SITE AND MAJOR SULFUR DIOXIDE EMISSIONS SOURCES

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

rev. 07-22-82



LEGEND

1. FPL-MANATEE
2. ESTECH
3. MISSISSIPPI CHEMICAL
4. GARDINIER
5. CITY OF WAUCHULA

0 10 20 30 40

SCALE IN KILOMETERS

SOURCE: ESE 1982.

Figure 3.4-3
LOCATION OF AMAX PROPOSED MINE SITE AND MAJOR NITROGEN DIOXIDE EMISSION SOURCES

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

Corporation phosphate rock drying facility. Major sources to the south of the proposed site include Asphalt Developers and Macasphalt, Inc., in Charlotte County. The only major source to the west of the site is Macasphalt, Inc., in Sarasota County. The Florida Power & Light Manatee power plant is located slightly greater than 50 km to the northwest of the site, but was included in Figure 3.4-1 because it is potentially a larger pollutant emitter than any of the sources located within 50 km of the site.

3.4.2 SULFUR DIOXIDE

Sources of sulfur dioxides are related to fuel burning and chemical processes. The locations of major sulfur dioxide emission point sources (>50 tons/yr) within 50 km of the proposed site are shown in Figure 3.4-2. There are no major sulfur dioxide sources located within 20 km of the site. Most of the major sources of particulate matter shown in Figure 3.4-1 are also major sources of sulfur dioxide. These sources include Gardinier, Inc.; American Orange; the permitted but not yet constructed Mississippi Chemical Corporation facility; Asphalt Developers; the Macasphalt, Inc., facilities in Charlotte and Sarasota Counties; and the FP&L Manatee Plant. Another major source of sulfur dioxide within 50 km is the City of Wauchula's power plant located about 40 km to the northeast of the site.

3.4.3 NITROGEN OXIDES

Nitrogen oxides are a by-product of the high temperature combustion of coal, gas, and fuel oils, and their emissions are related to fuel burning facilities. Figure 3.4-3 shows the locations of major point sources of nitrogen oxides (>50 tons/yr) within approximately 50 km of the proposed AMAX site. These major nitrogen oxides sources, which include Gardinier, Inc., the permitted Estech-Duette facility, the City of Wauchula's power plant, the permitted Mississippi Chemical Corporation facility, and FP&L Manatee, are generally also major sources of sulfur dioxide.

3.4.4 OTHER POLLUTANTS

Sources of atmospheric hydrocarbons generally coincide with fuel storage facilities and fuel combustion sources. The major sulfur dioxide and nitrogen oxides sources shown in Figures 3.4-2 and 3.4-3 are fuel combustion sources. No existing significant point sources of fluoride emissions currently are located within 50 km of the AMAX site. The largest sources of atmospheric fluorides nearest to the site are located in the Hillsborough County/Polk County phosphate mine district.

3.4.5 EMISSION INVENTORY

Tables 3.4-1 and 3.4-2 present the SO_2, particulate matter, and NO_x emission inventory used to develop the preceding discussion. The inventory includes plant ID number, plant name, UTM coordinates, and annual permitted and/or estimated actual emissions. Table 3.4-1 lists sources included in the PSD baseline emissions, and Table 3.4-2 lists increment-consuming sources and emissions. Although each source is not a major source (>50 tons per year) for all three pollutants, emission data are presented, if known, for each pollutant.

3.5 MEASURED AIR QUALITY--GENERAL

As discussed in the introduction to this baseline description, the measurement of ambient air quality levels at the proposed AMAX site was not initially required by EPA or contained in the POS for the Environmental Impact Statement. However, in view of AMAX's acquisition of additional lands from Noranda, consideration of the site as a location for a rock dryer, and the possibility of revised PSD regulations which would alter preconstruction monitoring requirements, AMAX desired to obtain baseline air quality information, and an ambient monitoring program for the site was developed. The program included the acquisition of air data gathered previously by Noranda, as well as the initiation of an air monitoring network.

The ambient monitoring program conducted at the AMAX site is summarized in Table 3.5-1. Figure 3.5-1 shows the AMAX site ambient air monitoring locations and station numbering system used in this document.

Table 3.4-1. Summary of Point Sources with Baseline Emissions (Before December 1977) Greater Than 50 Tons/Year of Particulate Matter, SO_2, or NO_x

County	APIS	Plant Name	UTM Coordinates East (km)	UTM Coordinates North (km)	Maximum Permitted Baseline* Emissions (tons/yr) PM	SO_2	NO_x
Hardee	40-25-0006-01	American Orange Corp.	419.8	3047.3	10	80	30
	-02	American Orange Corp.	419.8	3047.3	3	40	10
	-03	American Orange Corp.	419.8	3047.3	18	NA	NA
	-04	American Orange Corp.	419.8	3047.3	10	NA	NA
	-06	American Orange Corp.	419.8	3047.3	UN	UN	UN
	40-25-0009-01	City of Wauchula-Powerplant	419.8	3046.5	4(5)	36	13(19)
	-02	City of Wauchula-Powerplant	419.8	3046.5	4(5)	36	13(19)
	-03	City of Wauchula-Powerplant	419.8	3046.5	4(5)	36	13(19)
	-04	City of Wauchula-Powerplant	419.8	3046.5	4(5)	36	13(19)
	-05	City of Wauchula-Powerplant	419.8	3046.5	4(5)	36	13(19)
Manatee	40-41-0010-01	Florida Power & Light Manatee	367.6	3055.1	3,035	36,722	9,105
	-02	Florida Power & Light Manatee	367.6	3055.1	3,035	36,722	9,105
Charlotte	52-08-0002-01	Asphalt Developers	400.7	2977.6	145	85	19
	52-08-0001-01	Macasphalt Inc.	387.9	2988.9	163	NA(137)	NA(39)
Sarasota	40-58-0001-01	Macasphalt Inc.	348.7	3028.0	42(121)	NA(204)	NA(36)
Polk	40-53-0044-01	Gardinier	415.3	3063.3	175	854	268†
DeSoto	40-14-0003-01	Myakka Processors	409.9	3010.3	18	NA(30)	NA(10)
	-02	Myakka Processors			NA	27	NA(5)
	-03	Myakka Processors			12	NA	NA

* Estimated actual emissions are given in parentheses if those emissions are greater than maximum permitted emissions or if no maximum permitted emissions are specified.
† NO_x emissions based on AP-42 emission factor.
NA = Not applicable.
UN = Unknown data.

Sources: Florida DER, 1978, 1982.
EPA, 1975.
ESE, 1982.

Table 3.4-2. Summary of Point Sources with New Emissions (After December 1977) Greater Than 50 Tons/Year of Particulate Matter, SO_2, or NO_x

County	APIS	Plant Name	UTM Coordinates East (km)	UTM Coordinates North (km)	Maximum Permitted Emissions† (tons/yr) PM	SO_2	NO_x
Hardee	40-25-0011-01	American Orange Corp.	419.8	3047.3	23	99	NA
	-02	American Orange Corp.	419.8	3047.3	38	99	NA
	40-25-0012-01	Mississippi Chemical Corp.*	409.5	3045.0	89	1,253	343
	-02	Mississippi Chemical Corp.*	409.5	3045.0	6	80	13
	-03	Mississippi Chemical Corp.*	409.5	3045.0	4	48	8
	-04	Mississippi Chemical Corp.*	409.5	3045.0	10	NA	NA
	-05	Mississippi Chemical Corp.*	409.5	3045.0	25	NA	NA
	-06	Mississippi Chemical Corp.*	409.5	3045.0	14	NA	NA
	-07	Mississippi Chemical Corp.*	409.5	3045.0	14	NA	NA
Manatee	40-41-0038-01	Estech General Chemicals Corp.*	388.9	3047.2	—	12	3
	-02	Estech General Chemicals Corp.*	388.9	3047.2	101	38	282
	-03	Estech General Chemicals Corp.*	388.9	3047.2	38	NA	NA
	-04	Estech General Chemicals Corp.*	388.9	3047.2	25	NA	NA
DeSoto	40-14-0008-01	American Orange Corp.	433.2	3009.8	5(21)	NA	NA
	-02	American Orange Corp.			NA(11)	NA(128)	NA(3)
	-03	American Orange Corp.			22	15(128)	30
	40-14-0009-01	Highway Pavers Inc.	412.0	3005.0	9	59(60)	NA

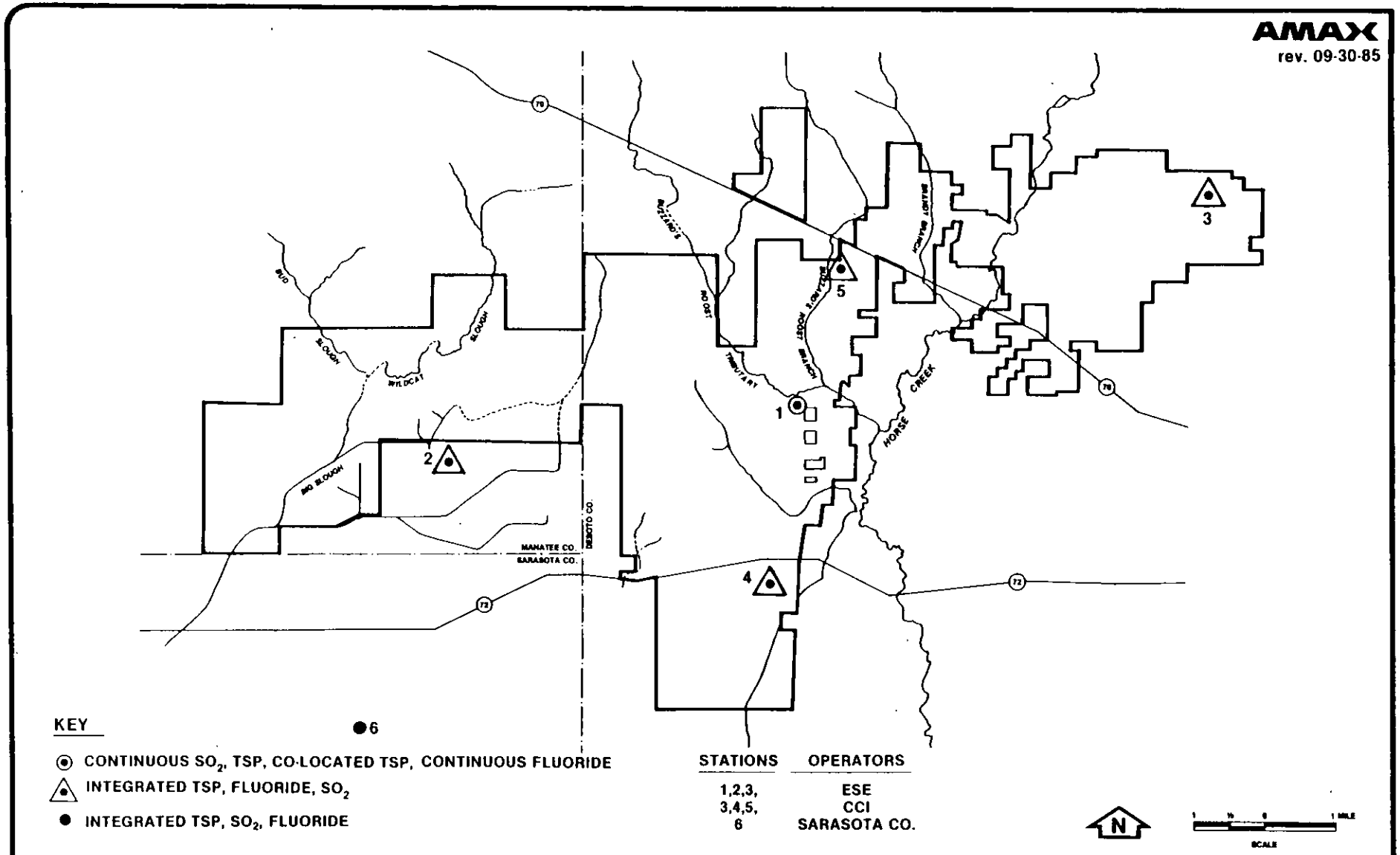
* Emission data taken from construction permit.
NA = Not applicable.
† Estimated actual emissions are given in parentheses if those emissions are greater than maximum permitted emissions or if no maximum permitted emissions are specified.

Sources: Florida DER, 1982.
EPA, 1979.
ESE, 1981.

Table 3.5-1. Summary of Ambient Monitoring Programs Conducted at AMAX Phosphate Pine Level Site

Operator	Station	Time Period	Pollutants Monitored TSP	SO_2	F
ESE/AMAX	1, 2, 3	03/04/79-12/31/81	X		
	1	10/17/79-12/31/81		X	
	2	04/30/80-12/31/81		X	
	1	03/04/79-12/31/81			X
	2	10/06/79-01/04/80			X
CCI/Noranda	3, 4, 5	05/19/77-09/30/79	X	X	X
Sarasota County	6	01/01/77-12/31/81	X	X	
		01/01/80-12/31/81			X

Source: ESE, 1982.



SOURCE: ESE, 1982.

Figure 3.5-1
AMAX MINE SITE AMBIENT AIR MONITORING LOCATIONS

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

Air quality data have been collected by Conservation Consultants, Inc. (CCI) on the AMAX (Noranda) property. CCI obtained measurements of total suspended particulate matter (TSP), sulfur dioxide (SO_2) and atmospheric fluorides (F). Data were obtained by CCI from May 1977 through September 1979. Stations designated in this report as Stations 3, 4, and 5 (Figure 3.5-1) were referenced at that time as Noranda stations 3, 1, and 2 (N-3, N-1, and N-2) respectively.

In addition to the data collected for Noranda, ESE monitored for TSP, SO_2, and F. The ambient air monitoring network operated by ESE consisted of one continuous sulfur dioxide monitoring station (established October 1979), three TSP monitoring stations (various start dates), one continuous gaseous and particulate fluoride sampler (established October 1979), one bubbler fluoride sampler (established March 1979), and a colocated TSP sampler for quality assurance purposes (established October 1979). The ambient air quality samplers were set up at various times (Table 3.5-1) because of AMAX's acquisition of new land (the Noranda property) and the desire for additional baseline air quality data. Three stations (1, 2, and 3) were operated by ESE through April 1980 as set forth in the addendum to the POS and have been maintained by AMAX since that time with quarterly quality assurance audits conducted by ESE.

Sarasota County also has an ambient air quality monitoring station which was located southwest of the proposed AMAX site (Station 6). This station has been measuring SO_2 and TSP air quality since September 1976, and gaseous fluorides since 1980.

3.5.1 TSP MEASUREMENT RESULTS

Measurements of TSP were taken at six locations in the general vicinity of the proposed site, as shown in Figure 3.5-1 and Table 3.5-1. All measurements were taken by using High Volume samplers in accordance with the suspended particulate measurement reference method (EPA, 1971, 40 CFR 50, Appendix B). Measurements were conducted on an

every-sixth-day schedule corresponding to the National Ambient Sampling Network (NASN) sampling schedule. Table 3.5-2 presents a summary of the data collected.

Data from Stations 1, 2, and 3, operated by ESE, displayed fairly consistent observed 24-hour TSP levels, reflecting the rural, remote nature of the area. Maximum 24-hour values ranged from 43 ug/m^3 at Station 2 to 105 ug/m^3 at Station 1. Geometric means ranged from 23 ug/m^3 to 32 ug/m^3 for the 3-year period for the three stations, again reflecting fairly consistent levels.

Stations 3, 4, and 5 were operated by CCI beginning in May 1977 and ending in September 1979. The maximum observed 24-hour value at any of the CCI stations was 142 ug/m^3 at Station 5. A local agricultural influence probably caused this high value (CCI, 1980; EPA, 1979). The next highest 24-hour TSP measurement at Station 5 was 59 ug/m^3, which further suggests that a locally occurring phenomenon caused the highest value. The maximum 24-hour TSP observation at any of the other CCI stations was 128 ug/m^3, representing 85 percent of the 150 ug/m^3 standard. This value, although not specifically identified as being attributable to local or unknown influences, is also suspect due to the rural, remote nature of the site area. Other than the two abnormally high values, the CCI data are consistent with the ESE data taken at Stations 1, 2, and 3. For the CCI data, geometric means ranged from 21 ug/m^3 to 28 ug/m^3, depending upon the reporting period. These values represent less than 50 percent of the 60 ug/m^3 annual standard.

TSP data from the Sarasota County station, covering a 5-year period beginning in 1977, display a maximum 24-hour value of 94 ug/m^3 and a second-highest value of 83 ug/m^3. The annual geometric mean for this time period ranged from 25 ug/m^3 to 32 ug/m^3. These data

Table 3.5-2. Summary of Total Suspended Particulate Concentrations in the Vicinity of the Proposed AMAX Site (Results in ug/m^3)

Station	Operator	Time Period	No. of Obs.	Geometric Mean	Maximum 24-Hour	Second Highest 24-Hour
1	ESE	3/4/79-12/31/79	47	31.5	92	64
		1/1/80-12/31/80	59	27.8	85	56
		1/1/81-12/31/81	55	27.0	105	94
		3/4/79-12/31/81	161	29.0	105	94
2	ESE	3/4/79-12/31/79	22	23.4	43	38
		1/1/80-12/31/80	60	24.9	90	52
		1/1/81-12/31/81	56	24.5	86	81
		3/4/79-12/31/81	138	25.0	90	81
3	ESE	3/4/79-12/31/79	8	29.1	43	37
		1/1/80-12/31/80	59	25.8	52	52
		1/1/81-12/31/81	47	24.8	96	90
		3/4/79-12/31/81	114	26.0	96	90
3	CCI (N-3)	5/19/77-9/30/79	136	22-26	128	60
4	CCI (N-1)	5/19/77-9/30/79	138	21-27	66	63
5	CCI (N-2)	5/19/77-9/30/79	135	22-28	142*	59
6	Sarasota County	1/1/77-12/31/79	—	28-31	94	83
		1/1/80-12/31/80	53	25	78	54
		1/1/81-12/31/81	54	32	88	79

Notes: Annual Ambient Air Quality Standard is 60 ug/m^3 (Geometric Mean).
24-Hour Ambient Air Quality Standard is 150 ug/m^3.
Short-term standards ($\leq$ 24-hours) are not to be exceeded more than once per year.

* Local agricultural influence expected (Conservation Consultants, Inc., 1980).

Sources: ESE, 1982.
CCI, 1980.
EPA, 1982.

also are consistent with the rural nature of the area and the data obtained by the ESE and CCI monitors.

3.5.2 SULFUR DIOXIDE MEASUREMENT RESULTS

Measurements of sulfur dioxide were conducted at six locations in the general vicinity of the AMAX phosphate site. All measurements, except those at Station 1, were performed by using the 24-hour integrated bubbler sample Federal Reference Method (EPA, 1971, 40 CFR, Appendix A). Integrated 24-hour SO_2 bubbler samples were taken at five sampling locations: by ESE at Station 2 from April 1980 through December 1981; by CCI at Stations 3, 4, and 5 from May 1977 through September 1979; and by Sarasota County at Station 6 from January 1977 through December 1981. The samples were collected every sixth day, concurrent with TSP measurements, under the required temperature-controlled conditions. Table 3.5-3 presents a summary of the data collected. The maximum observed 24-hour value was 110 ug/m^3 and occurred at Station 5. This value is 42 percent of the 260 ug/m^3 24-hour standard. The maximum observed arithmetic mean was 12 ug/m^3 or 20 percent of the annual arithmetic mean standard of 60 ug/m^3 standard.

The Meloy model 285-E SO_2 analyzer was used at the AMAX continuous monitoring station (Station 1) until the first quarter of 1981. This analyzer uses the flame ionization detection method for detecting sulfur dioxide and converts it to electronic signals and then transmits it to a strip-chart recorder. The Thermo-Electron Model 43 pulsed fluorescence continuous SO_2 analyzer was used at the station from the first quarter of 1981 to the present. A quality assurance manual, which includes standard operating procedures, was developed prior to sampling to insure that data are collected in a uniform and accurate manner and to comply with all PSD air quality analysis requirements (ESE, 1979).

Continuous sulfur dioxide monitoring has been conducted at Station 1 from October 1979 through December 1981. A total of 16,198 1-hour observations were obtained over the sampling period, representing a data

Table 3.5-3. Summary of Sulfur Dioxide Concentrations in the Vicinity of the Proposed AMAX Site (Results in ug/m^3)

Station	Operator	Date of Operation	Number of Observations	Maximum 24-Hour Obs.	Second Highest 24-Hour Obs.	Annual Arithmetic Mean
2	ESE	4/3/80-12/31/80	45	21	14	4
		1/1/81-12/31/81	53	13	12	5
		4/3/80-12/31/81	98	21	14	5
3	CCI (N-3)	5/19/77-9/30/79	128	105	44	5-11
4	CCI (N-1)	5/19/77-9/30/79	127	74	60	7-12
5	CCI (N-2)	5/19/77-9/30/79	126	110	37	7-11
6	Sarasota County	1/1/77-12/31/79	—	41	30	4-5
		1/1/80-12/31/80	54	23	8	3
		1/1/81-12/31/81	42	8	7	3

Station	Operator	Date of Operation	No. of Obs.	24-Hour Average		3-Hour Average		Arithmetic Mean
				Maximum	Second-Highest	Maximum	Second-Highest	
1	ESE	10/17/79-12/31/79	1,621	36	36	158	137	6
		1/1/80-12/31/80	7,622	37	37	91	82	5
		1/1/81-12/31/81	6,955	68	67	115	112	7
		10/17/79-12/31/81	16,198	68	67	158	136	6

Notes: Annual Ambient Air Quality Standard is 60 ug/m^3 (Arithmetic Mean).
24-Hour Ambient Air Quality Standard is 260 ug/m^3.
3-Hour Ambient Air Quality Standard is 1,300 ug/m^3.
Short-term standards ($\leq$ 24-hours) are not to be exceeded more than once per year.

Sources: ESE, 1982.
CCI, 1979.
EPA, 1980-1982.

Table 3.5-4. Summary of Gaseous and Particulate Fluoride Measurements in the Vicinity of the Proposed AMAX Site (Results in ug/m^3)

Station	Operator	Date of Operation	Number of Observations	Maximum 24-Hour Obs.*	Arithmetic Mean*
1	ESE	3/4/79-9/30/79†	—	<2.8	<2.8
		10/18/79-12/31/79**	12	0.76 (0.04)	0.14 (<0.02)
		1/1/80-12/31/80**	38	0.07 (<0.02)	0.01 (<0.02)
		1/1/81-12/31/81**	53	0.38 (0.23)	0.12 (0.07)
		10/18/79-12/31/81	103	0.76 (0.23)	0.09 (0.04)
2	ESE	10/6/79-11/17/79†	--	<2.8	<2.8
		11/23/79-1/4/80†	--	<1.4	<1.4
3	CCI (N-3)	5/19/77-9/30/79	136	4.6	0.41-0.74
4	CCI (N-1)	5/19/77-9/30/79	139	2.7	0.44-0.67
5	CCI (N-2)	5/19/77-9/30/79	135	3.1	0.41-0.62
6	Sarasota County	1/1/80-12/31/80	53	All values below minimum detectable limit of 7.9 ug/m^3	
		1/1/81-12/31/81	55		

* Numbers in parentheses represent the measured particulate fluoride concentration in ug/m^3.

† Bubbler method minimum detectable limit of procedure was changed from 2.8 ug/m^3 to 1.4 ug/m^3 in November 1979.

**Double-tape gaseous/particulate monitor. Minimum detectable limit of procedure is 0.02 ug/m^3.

Sources: ESE, 1982.
CCI, 1979.

recovery of approximately 82 percent. The maximum 24-hour and 3-hour SO_2 values from the continuous monitor were 68 ug/m^3 and 158 ug/m^3, respectively, representing 26 percent and 12 percent of the State of Florida AAQS, respectively. The measured arithmetic mean for the time period represents 10 percent of the annual Florida AAQS. Second-highest measured concentrations are similar to the maximum concentrations.

3.5.3 FLUORIDE MEASUREMENT RESULTS

Ambient data have been gathered in the vicinity of the proposed site for both gaseous and particulate fluorides. "Gaseous" fluorides exist as a gas in the atmosphere; "particulate fluorides" are the portion of suspended particulate matter which is fluoride.

ESE operated a gaseous fluoride bubbler at Station 1 from March 1979 to October 1979, at which time it was moved to Station 2. A double tape continuous fluoride monitor (manufactured by Research Appliance Corporation) was installed with the continuous sulfur dioxide monitor at Station 1 beginning in October 1979 and was utilized to determine both particulate and gaseous fluoride levels. All double tape fluoride measurements were performed in accordance with procedures presented in Methods of Air Sampling and Analysis (American Public Health Association, 1977). Gaseous fluoride bubbler samples also were collected at Stations 3, 4, and 5 from May 1977 through September 1979 by CCI and by Sarasota County at Station 6 in 1980 and 1981. All sampling was conducted on an every-sixth-day schedule concurrent with TSP and sulfur dioxide measurements.

A summary of the available gaseous fluoride data is presented in Table 3.5-4. The maximum observed value at any of these stations using the bubbler method was 4.6 ug/m^3 and occurred at Station 3. The maximum arithmetic average was 0.74 ug/m^3 and also occurred at Station 3. The measured CCI data display gaseous fluorides levels much

higher than would be expected in a remote area without significant sources of atmospheric fluorides. In the report developed by CCI concerning the Noranda data (CCI, 1980), problems in the fluoride bubbler measurement method and analysis method were described. The highest measured 24-hour values for the measurement period were specifically identified as suspect. It is noted that from December 1978 through September 1979, the highest 24-hour fluoride measurement at any CCI station was 1.4 ug/m^3.

The fluoride bubbler data collected by ESE through January 1980 are limited because the minimum detectable limit of the sampling procedure utilized was 1.4 ug/m^3 or greater. No observations above this limit were recorded during this period. During October 1979, the double-tape fluoride sampler was initiated at Station 1 with a minimum detectable limit of 0.02 ug/m^3. Using the double-tape sampler, the maximum observed 24-hour gaseous fluoride level was 0.76 ug/m^3, and the maximum observed 24-hour particulate fluoride level was 0.23 ug/m^3. The arithmetic mean gaseous fluoride concentration for Station 1 was 0.09 ug/m^3, and the arithmetic mean particulate fluoride concentration was 0.04 ug/m^3.

Sarasota County has also measured gaseous fluorides using the bubbler method at Station 6. During 1980 and 1981, no values above the minimum detectable limit of the method (7.9 ug/m^3) were recorded.

Manatee County has enacted an ambient air standard for fluorides. The standard, which is 1 ppb (0.78 ug/m^3) maximum 24-hour average, relates to the maximum impact beyond the property boundary due to any individual plant. No standard has been passed which can be compared to the total ambient impact of all fluoride-emitting sources.

3.6 ESTIMATED EXISTING AIR QUALITY

Existing levels of pollutants at the site are expected to be at or near background levels. Background levels of pollutants are a function of geographical location, meteorology, and topography. Monitoring conducted at the proposed site is generally representative of background levels because of the lack of industrialization and the remoteness of the area.

The AMAX POS document presented assumed background air quality levels for the mine site, since initially no monitoring was anticipated. The assumed background levels, derived from U.S. EPA guidance documents, were as follows:

TSP	35 ug/m^3
SO_2	20 ug/m^3
NO_2	20 ug/m^3
F	Level to be assigned based upon county monitoring data

The baseline air quality levels, documented in this section, differ in some ways from these initial estimates. The 35 ug/m^3 TSP value, although typical of annual geometric mean levels recorded in rural remote areas of the southeastern U.S., appears to be high. Actual measurements indicate that a lower value of 25 ug/m^3 to 30 ug/m^3 is justified based on the geometric means from all 6 montitoring stations which ranged from 21 to 32 ug/m^3. However, a higher value should be used for the maximum 24-hour background level since maximum 24-hour TSP measurements ranged from 43 to 105 ug/m^3 (deleting assumed biased measurements of 142 ug/m^3 and 128 ug/m^3).

Comparison of the SO_2 results to the initially assumed background of 20 ug/m^3 yields similar results. This level is considered too high for an annual time period: measured data indicate 10 ug/m^3 or less is representative. For the 24-hour and 3-hour averaging times, a range of concentrations was again experienced. Maximum 24-hour concentrations

based on bubbler data ranged from 8 ug/m^3 to 110 ug/m^3, and second-highest 24-hour values ranged from 7 ug/m^3 to 60 ug/m^3. The highest 24-hour average based upon continuous monitoring data was 68 ug/m^3, and the 3-hour maximum was 158 ug/m^3.

NO_2 data were not taken at the mine site; therefore, the assumed background of 0.01 ppm (20 ug/m^3) is still considered to be representative.

Gaseous fluoride data obtained by the bubbler method are inconclusive since CCI cited problems with the measurement technique, and values obtained from the ESE and Sarasota County stations were all below the minimum detectable limit of the measurement methods. As a result, the double-tape sampler provides the best estimate of existing gaseous and particulate fluoride concentrations at the site: the maximum 24-hour gaseous and particulate fluorides levels measured were 0.76 ug/m^3 and 0.23 ug/m^3, respectively. Arithmetic mean levels were 0.09 ug/m^3 for gaseous fluorides and 0.04 ug/m^3 for particulate fluorides.

Consumption of PSD increments in the vicinity of the AMAX site is believed to be small in comparison to the allowable increments. Increment-consuming sources located within about 50 km of the site are: American Orange, located about 40 km to the northeast; the permitted Estech facility, 40 km north; and the permitted Mississippi Chemical Corporation facility, located about 35 km northeast. These sources impact primarily SO_2 increments, but also have small impacts upon TSP increment consumption. No other sources, facilities, or developments are known to be planned in the vicinity of the AMAX site at this time.

3.7 PROJECTED ENVIRONMENT WITHOUT THE PROPOSED PROJECT

Without the proposed project, the projected future air quality levels are expected to be similar to the estimated existing air quality levels described in Section 3.6. However, the proposed, but not yet operating sources within 50 km of the site, which consist of the Estech and Mississippi Chemical Corporation rock drying facilities, may elevate the existing air quality levels slightly. Due to the distance of the proposed site to these sources (35 to 40 km), significant effects on the proposed site are not expected from these sources.

No other new phosphate rock drying, chemical plant operations, or other potential sources are known to be planned for the area at this time. However, if such sources do locate near the proposed AMAX site, the existing air quality could be significantly altered. Increased phosphate mining activities in Hardee and Manatee Counties will probably cause a slight increase in TSP levels at the site.

Counties surrounding the proposed site, which include Hardee, DeSoto, Manatee, and Sarasota, are projected to experience population increases even if the proposed project is not constructed (see Section 10, Socioeconomics). As a result of these population increases, anthropogenic activities (i.e., agricultural activities, vehicular traffic, etc.) are likely to result in small increases in maximum and average air quality concentrations at the AMAX site in the future.

3.8 NOISE

3.8.1 SOUND MEASUREMENT

The human ear perceives sound between frequencies of 16 and 20,000 Hertz. One important characteristic of the human ear is that throughout its range of perception, sounds of equal pressure level at different frequencies are not perceived equally. Sounds of low and high frequencies are not heard as easily as sounds in the mid-range. A commonly used weighting scale, which nearly approximates the response of the human ear, is the A scale. A sound level meter measures the A scale by electronically attenuating low and high frequency sounds.

The unit of measure in acoustics is the decibel (dB), defined as:

$$dB = 10 \log PA^2/PR^2$$

where PA is the measured sound pressure level, and
PR is a reference level (in this case, 20 micropascals).

Guidelines for environmental noise are defined in terms of the A scale and are expressed as one of the following statistical measures [United States Environmental Protection Agency (EPA), 1974]:

1. L_{10}--the sound level which is exceeded 10 percent of the time during a measurement period.
2. L_{50}--the sound level which is exceeded 50 percent of the time during a measurement period.
3. $L_{eq(24)}$--the sound level equal in cumulative energy to all time-varying noise produced during a 24-hour period.
4. L_{dn}--the equivalent sound level for day (7 a.m.--10 p.m.) and night (10:00 p.m.--7:00 a.m.) in which the equivalent night time level has been biased by the addition of 10 decibels.

EPA (1974) also presents the following information on the nighttime weighting factor:

> The choice of the 10 dB nighttime weighting in the computation of L_{dn} has the following effect: In low noise level environments below L_{dn} of approximately 55 dB, the natural drop in L_{dn} values is approximately 10 dB, so that daytime and nighttime levels contribute about equally to L_{dn}. However, in high noise

environments, the night noise levels drop relatively little from their daytime values. In these environments, the nighttime weighting applies pressure towards around-the-clock reduction in noise levels if the noise criteria are to be met.

3.8.2 NOISE GUIDELINES

EPA has published noise levels requisite to protect the public against hearing loss or activity interference for various land use categories (EPA, 1974) (see Table 3.8-1). Sound levels are given as $L_{eq(24)}$ and $L_{eq(dn)}$ and are yearly averages on an energy basis. These values are for long-term exposures and take into consideration the cumulative effects of noise. Requisite noise levels have been set to protect the public against hearing loss such that 96 percent of the population will not experience a hearing threshold shift of more than five dBA at 4000 hertz in 40 years of continual exposure.

In addition to EPA's published guidelines, the U.S. Department of Transportation has published Design Noise level criteria based upon land use (U.S. Federal Highway Administration, 1976) (see Table 3.8-2). Highway noise has long been recognized as a major contributor to environmental noise, thus, the suggested criteria, based on L_{10}'s, have been developed for various land use categories.

Table 3.8-1. Yearly Average* Equivalent Sound Levels Requisite to Protect the Public Health and Welfare

Land Use	Measure	INDOOR			OUTDOOR		
		Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects**	Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects**
1 Residential with Outdoor Space and Farm Residences	L_{dn}	45		45	55		55
	$L_{eq}(24)$		70			70	
2 Residential with No Outside Space	L_{dn}	45		45			
	$L_{eq}(24)$		70				
3 Commercial	$L_{eq}(24)$	†	70	70 ††	†	70	70 ††
4 Inside Transportation	$L_{eq}(24)$	†	70	†			
5 Industrial	$L_{eq}(24)$***	†	70	70 ††	†	70	70 ††
6 Hospitals	L_{dn}	45		45	55		55
	$L_{eq}(24)$		70			70	
7 Educational	$L_{eq}(24)$	45		45	55		55
	$L_{eq}(24)$***		70			70	
8 Recreational Areas	$L_{eq}(24)$	†	70	70 ††	†	70	70 ††

Table 3.8-1. Yearly Average* Equivalent Sound Levels Requisite to Protect the Public Health and Welfare (continued, page 2 of 2)

Land Use	Measure	INDOOR			OUTDOOR		
		Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects**	Activity Interference	Hearing Loss Consideration	To Protect Against Both Effects**
9 Farm Land and General Unpopulated Land	$L_{eq}(24)$				†	70	70 ††

* Refers to energy rather than arithmetic averages.

† Since different types of activities appear to be associated with different levels, identification of a maximum level for activity interference may be difficult except in those circumstances where speech communication is a critical activity.

** Based on lowest level.

†† Based only on hearing loss.

*** An $L_{eq}(8)$ of 75dB may be identified in these situations so long as the exposure over the remaining 16 hours per day is low enough to result in a negligible contribution to the 24-hour average, i.e., no greater than an L_{eq} of 60 dB.

NOTE: Explanation of identified level for hearing loss. The exposure period which results in hearing loss at the identified level is a period of 40 years.

Source: U.S. Environmental Protection Agency, 1974.

Table 3.8-2. Federal Highway Administration Design Noise Level/Land Use Relationships

Land Use Category	Design Noise Level - L_{10}*	Description of Land Use Category
A	60 dBA (Exterior)	Tracts of lands in which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	70 dBA (Exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sports areas, and parks.
C	75 dBA (Exterior)	Developed lands, properties or activities not included in categories A and B above.
D	Variable	For requirements on undeveloped lands see paragraph 5a(5) and (6), Federal Highway Administration policy and procedure manual.
E	55 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

*L_{10} represents the level which can be exceeded no more than 10 percent of the time.

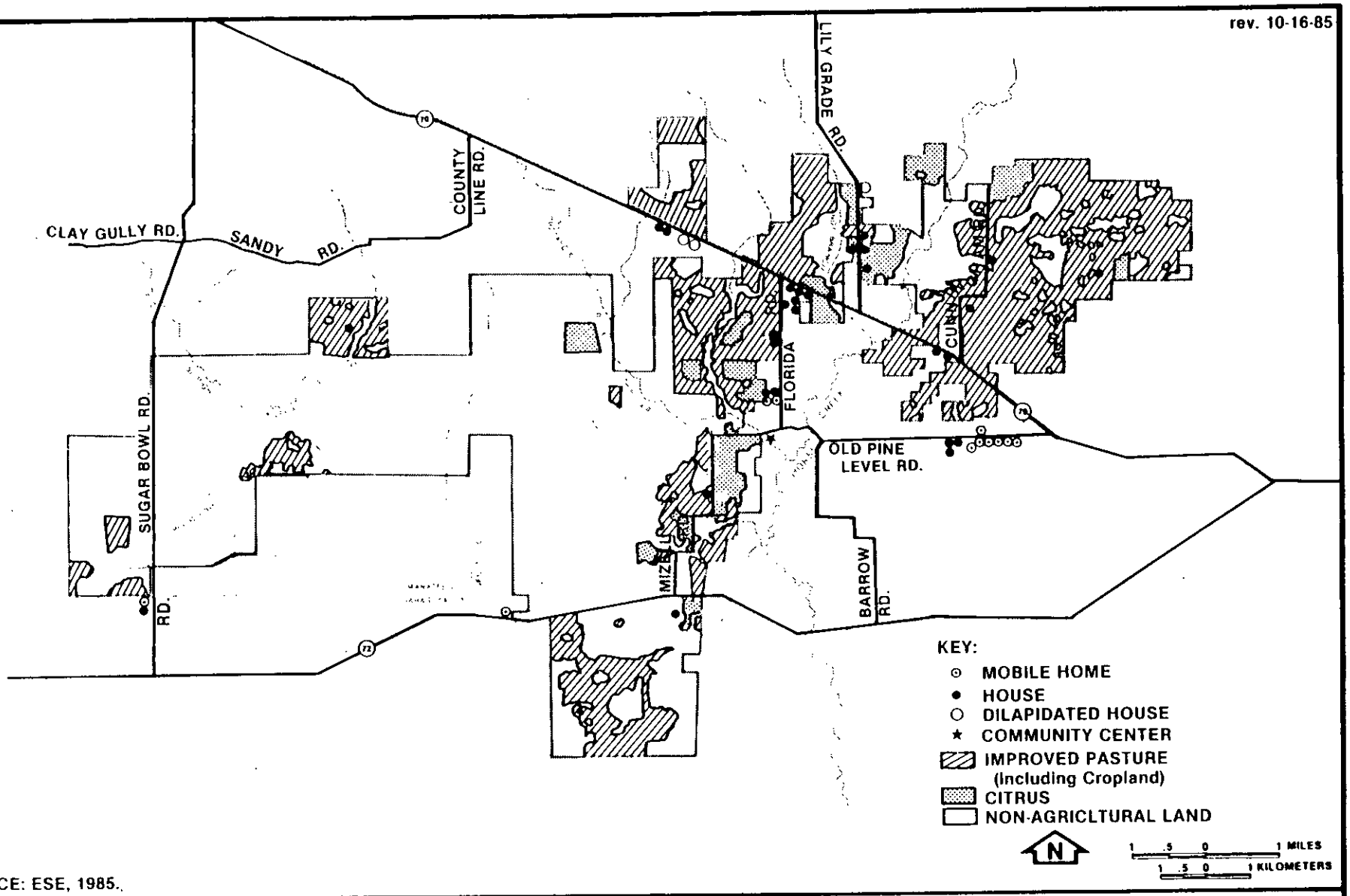
Source: U.S. Federal Highway Administration, 1976.

3.8.3 EXISTING NOISE ENVIRONMENT

The existing land use of the proposed site area (see Figure 3.8-1) reflects the rural nature of the site. Existing land use on properties surrounding the proposed site is also rural, agricultural with very low population densities. There are currently no major noise sources in the area. A few scattered residences, a church, and a community center, are located on the eastern portion of the site. The most significant anthropogenic noise sources are Highways 70 and 72 and the county roads near and on the site. The City of Arcadia, located approximately 10 km to the east, is the nearest population center to the proposed site.

In the initial POS for the AMAX EIS (December 1978), noise monitoring was not required for the Pine Level site, then planned for only mining purposes (i.e., no rock dryer). The POS addendum (December 1979) also did not require baseline noise monitoring at the Pine Level site. Even though the site was then being considered for the rock drying facility, baseline noise monitoring was not considered necessary because of the existing rural, remote nature of the area, and no baseline noise monitoring was performed.

Baseline noise levels at the Pine Level site can be estimated from available literature. Various authors have compiled examples of typical sound levels for different land use types (Table 3.8-3 and Figure 3.8-2). In a rural area such as the AMAX site, the expected overall L_{dn} is 40 to 45 dBA, a range representative of rural or quiet suburban areas. Noise levels may be somewhat higher for intermittent periods near roadways or agricultural activity, or during periods of insect activity (i.e., crickets chirping during nighttime hours). These assumed baseline noise levels at the Pine Level site are similar to levels documented by ambient noise monitoring conducted for other site-specific phosphate EISs with similar rural, remote locations (e.g., Farmland Industries, Inc., 1981).



SOURCE: ESE, 1985.

Figure 3.8-1
EXISTING LAND USE

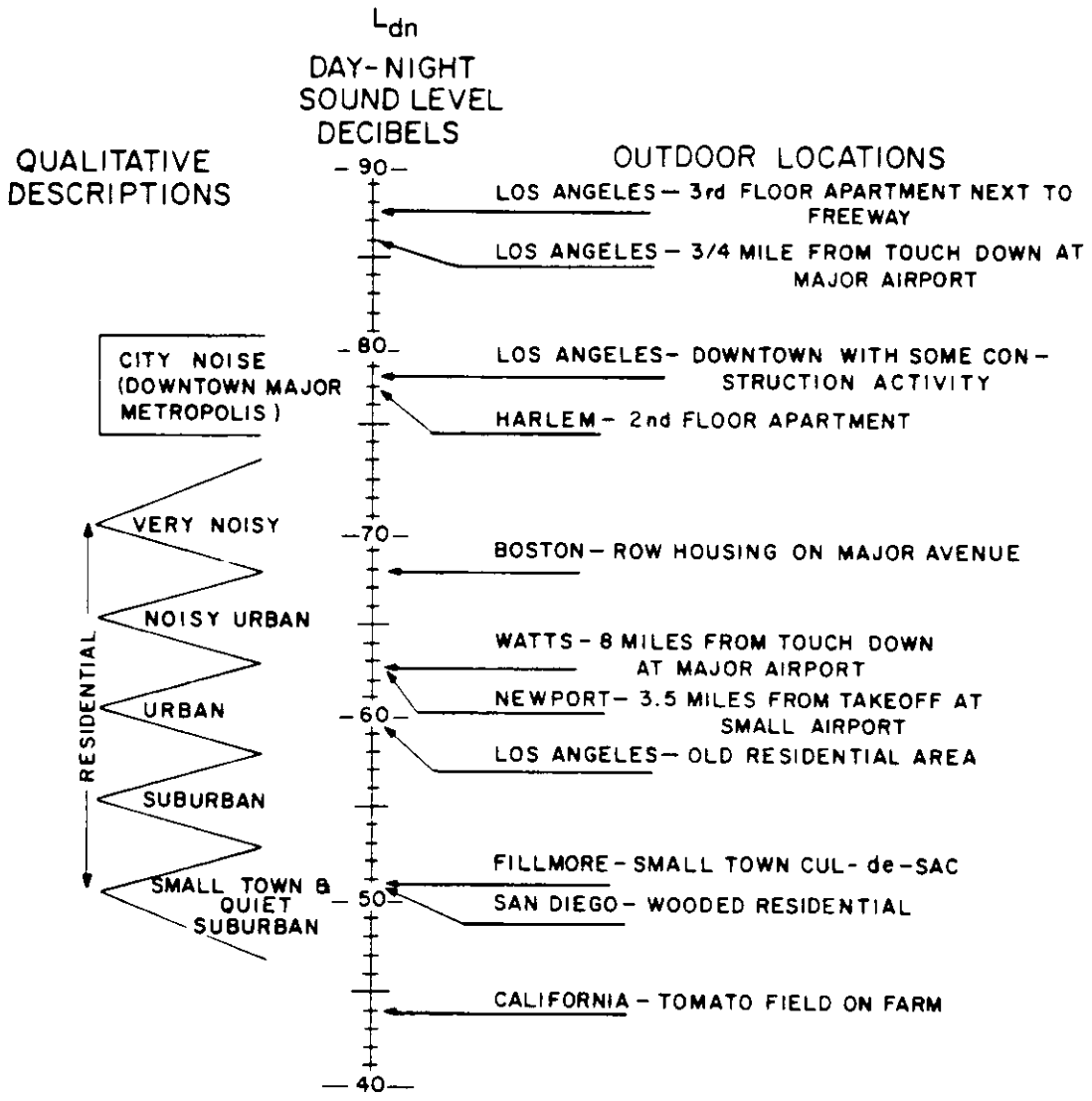
U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX CHEMICAL CORPORATION
Pine Level Mine
Manatee and DeSoto Counties, Florida

Table 3.8-3. Typical Values of Yearly Day-Night Average Sound Level for Various Residential Neighborhoods Where There Are No Well-Defined Sources of Noise Other Than Usual Transportation Noise

Description	Population Density (People/Sq Mi)	L_{dn} - dB
Rural (undeveloped)	20	35
Rural (partially developed)	60	40
Quiet Suburban	200	45
Normal Suburban	600	50
Urban	2,000	55
Noisy Urban	6,000	60
Very Noisy Urban	20,000	65

Source: National Academy of Science, 1977.



SOURCE: U. S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF NOISE ABATEMENT AND CONTROL, 1974.

Figure 3.8-2
EXAMPLES OF OUTDOOR DAY-NIGHT SOUND LEVEL IN dB (RE 20 MICROPASCALS) MEASURED AT VARIOUS LOCATIONS

U.S. Environmental Protection Agency, Region IV
Draft Environmental Impact Statement

AMAX PHOSPHATE, INC.
Pine Level Mine
Manatee and DeSoto Counties, Florida

3.8.4 PROJECTED ENVIRONMENT WITHOUT THE PROPOSED PROJECT

The projected noise levels at the Pine Level site without the proposed project are anticipated to be similar to those currently existing.

No other major industrial development is projected within 30 km of the site. Anthropogenic activities (i.e., agricultural, vehicular traffic, etc.) are likely to result in slight changes from the assumed baseline levels.

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