2490

UTILITY BOARD OF THE CITY OF KEY WEST

RECEIVED
DER - MAIL ROOM
1988 JUL 15 PM 12:36

POST OFFICE DRAWER 6100
KEY WEST, FLORIDA 33041-6100

TELEPHONE: (305) 294-5272
TELECOPIER: (305) 294-3685

July 14, 1988

VIA OVERNIGHT EXPRESS MAIL

RECEIVED
JUL 15 1988
DER - BAQM
1031

Mr. Clair Fancy, Central Air Permitting
Bureau of Air Quality Management
Florida Department of Environmental Regulations
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: PSD Application for Two 10-MW Diesel Generators at Key West, Florida

Dear Mr. Fancy:

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant. Our environmental engineer, R. W. Beck and Associates, has prepared the enclosed application for a construction permit and New Source Review. Original representative and engineer signature pages 1 and 2 from DER 17-1.202(1) are attached to the letter along with a $2000 check payable to DER for the processing fee. Four comb-bound copies of the application (including test, tables, figures and forms) and one comb-bound copy of the modeling printouts and experience information have been forwarded separately.

Mr. Michael D. Henderson of R. W. Beck and Associates had a pre-application meeting with your staff on June 30, 1988 to review the contents of the application on a preliminary basis and to identify additional issues requiring analysis to complete the application. Those items have been addressed in the application. It is understood that a fast-track process is available whereby any additional information required by DER could be requested via telephone. It is also understood that Mr. Barry Andrews is primarily responsible for BACT determination and will be leaving for a month's vacation on July 20, 1988. We have decided to not give our selected contract, Fairbanks Morse, notice to proceed until an indication of BACT is provided by DER. Should selective catalytic reduction ("SCR") be determined as BACT for emission of NOx, additional negotiations will be required with the contractor and CES may have to re-evaluate the decision to supply power with No. 2 oil-fired diesel generators.

In light of the need to retire three existing 16.5-MW steam units at the Key West plant by February , 1990 due to expiration of an extended variance from DER requirements for dissolved oxygen in the cooling water discharges and our contractors' schedule of beginning construction by November 1, 1988, we appreciate your assistance in expediting the review process. Any technical questions with regard to the application should be referred to Mr. Henderson.

Very truly yours,

UTILITY BOARD - CITY OF KEY WEST
"CITY ELECTRIC SYSTEM"

Robert R. Padron
General Manager

RRP/sh
cc:
Leo Carey, Ass't. to the Manager
Ralph Garcia, Sr., Ass't. to the Manager
Larry J. Thompson, Operations Manager
Paul Esquinaldo, Jr., Finance Manager
L. T. Curry, Jr., Production Manager
M. D. Henderson (1208F)
B. Pattinson

Enclosure

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896
(813)332-2667

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Diesel Engine Generating Station [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Key West City Electric System COUNTY: Monroe

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) two diesel generators

SOURCE LOCATION: Street Front Street extended City Key West

UTM: East 425 North 2716

Latitude 24 ° 33 ' 49 "N Longitude 81 ° 44 ' 03 "W

APPLICANT NAME AND TITLE: Robert R. Padron, Manager

APPLICANT ADDRESS: 1006 James Street Key West, Florida 33041

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of City Electric System

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: [signature]

Robert R. Padron, Manager
Name and Title (Please Type)

Date: 7/12/88 Telephone No. (303) 294-5272

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 judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

DER Form 17-1.202(1)
Effective October 31, 1982

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 D. R. Swann

Dennis R. Swann
Name (Please Type)

R. W. Beck and Associates
Company Name (Please Type)

1125 17th Street, Ste. 1900 Denver, CO 80202
Mailing Address (Please Type)

Florida Registration No. 37459 Date: 7/7/88 Telephone No. (303) 295-6900

7/7/88

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.

The Utility Board of the City of Key West, Florida is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 11/1/88 Completion of Construction 2/1/90

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.)

No post-combustion pollution control equipment is included with the diesel engines in the proposed BACT configuration.

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

Not Applicable

RECEIVED
JUL 15 1988
DER-BAQM

THE UTILITY BOARD OF THE CITY OF KEY WEST, FLORIDA DIESEL ENGINE GENERATING STATION

APPLICATION FOR CONSTRUCTION PERMIT AND NEW SOURCE REVIEW

SUBMITTED TO: FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Prepared by:

R. W. Beck and Associates
Denver, Colorado

July, 1988

INTRODUCTION

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant. The retirement of these steam units is necessary due to expiration of an extended variance from the Florida Department of Environmental Regulations ("DER") requirements for dissolved oxygen in the cooling water discharge.

The diesel generators will burn No. 2 fuel oil with a maximum sulfur content of 0.5 percent, and are expected to service the intermediate-load requirements of CES with the capability of going from standby to full load in 10 minutes. Two 500,000 gallon oil storage tanks will also be installed and provide fuel for approximately one month of operation at full load. The site currently houses one 37-MW steam unit and three 2-MW diesel peaking units, along with a 2,000,000 gallon storage tank for No. 6 fuel oil and a 69-KV switchyard. To make room for the new diesel generator, miscellaneous demolition, pond cleaning and utility rerouting will be required.

The Stock Island site comprises approximately 50 acres and is located approximately one mile east of the City of Key West on a peninsula which borders on Safe Harbor. A map of the vicinity and plot plan are shown in the attachments. The diesel generators will be installed to the south of the steam unit and west of the peaking diesel units. The diesel generators will be housed in a 80' x 80' x 40' (high) building with exhausts to separate 100 foot stacks. Existing docking facilities will be used for fuel unloading. A new No. 2 fuel oil unloading station will be installed adjacent to the existing No. 6 fuel oil unloading station, with the capability of unloading a 12,000 barrel barge in eight hours. Once-through cooling will be used with makeup from on-site wells and discharge to the existing discharge flume. The service water will be heat exchanged with the demineralized water used in a closed loop for engine cooling, starting air and lube oil systems. Power generated will be stepped up from 13.8-69 kV in a single transformer of 20,000 kVA capacity. The diesel generators will be capable of unattended operation.

The main issue associated with the application are Best Available Control Technology ("BACT") and air quality impacts. Contacts have been made with various DER personnel in the Marathon field office, Ft. Myers district office and the Tallahassee main office relative to other major sources in the area, meteorological data for use in calculating impacts, considerations in BACT review and Class I issues, and general procedures. These issues are discussed below and details are presented in the attachments and DER Form 17-1.202.

REGULATIONS

The Florida Department of Environmental Regulation ("DER") requirements for New Source Review and construction permit are spelled out in Chapters 17-2 and 17-4. Construction permits are required prior to beginning construction, and operating permits are issued for five years subsequent to construction and compliance testing (17-2.210(1,2) and 17-2.500(5). Applications are to be made on designated forms, submitted in quadruplicate, signed by a professional engineer registered in Florida and accompanied by the appropriate fee, $1000 for a source of more than 100 TPY of any pollutant (17-4.050(1-4)). DER has up to 30 days to request additional information (17-4.055(1)), has to provide notice 14 days after completion of the application (17-2.220(2)), make a preliminary determination within 60 days (17-2.500(5)) and provide the public a 30-day comment period on the preliminary determination (17-2.500(1)). A construction permit is to specify a time period for construction, startup and testing (17-4.210 (3)).

New Source Review includes the following requirements (17-2.500(1-5)) for sources emitting more than 250 TPY of any pollutant. Combined impacts must be less than ambient air quality standards and baseline plus PSD increments; all pollutants emitted in "significant" quantities are subject to BACT review and impact analysis; an exemption from ambient monitoring is allowed if impacts are "de minimus"; ambient impact analysis must be performed; impacts on visibility, growth, soils and vegetation must be analyzed; applications must include information on the nature, location, design capacity, operating schedule, construction schedule, BACT, and impacts calculations with associated input values; copies of the application must be sent to EPA and the Federal Land Manager for sources within 100 km of a Class I area.

The DER regulations are not specific on emissions of individual pollutants from diesel generators. All sources are required to limit plume opacity to 20 percent, unless the source is incapable of meeting the limit while operating so as to minimize opacity and comply with any applicable particulate standard (17-2.610(2)). DER is to make a BACT determination considering EPA determinations, available information, determinations made by other states, and social and economic impacts (17-2.630(1)). Federal New Source Performance Standards ("NSPS") are incorporated by reference. EPA proposed an NSPS (40 CFR Part 60 Subpart FF) for diesel generators on July 23, 1979, but has not promulgated the standard. The only pollutant which is regulated by the proposed standard is NO_x with a limit of 600 ppm, and 15 percent oxygen on a dry basis (this value corresponds to approximately 8 gm/hp-hr), with the limit adjusted upwards for engines with thermal efficiencies greater than 35 percent. The containment provisions of the NSPS for petroleum liquid storage vessels constructed after July 23, 1984 (40 CFR Part 60 Subpart Kb) only applies to vessels with capacity greater than 151 cubic meters (40,000 gallons) storing liquid with a maximum true vapor pressure greater than 3.5 kPa, which does not apply to No. 2 fuel oil. Thus, the fixed roof storage tanks which, based on AP-42 emission factors, are expected to have hydrocarbon emissions of approximately 14 TPY are not subject to further regulation. Compliance testing requirements for sources are to be specified in BACT determination (17-2.700, Table 1)), with the test procedures specified in 17-2.700 (1-7).

Among the other provisions of the DER regulations are two others which have specific notability to this application. During startup, shutdown and malfunctions, excess emissions are allowed for less than 2 hours out of 24, if best operational practices are utilized (17-2.250(1)). Changes in allowable PSD increments are associated with changes in actual emissions after a baseline date (initial PSD application in an area) (17-2.500(4)).

BACT ANALYSIS

In accordance with DER requirements, BACT has been reviewed for those pollutants emitted by the diesel generators in greater than significant quantities, taking into account other determinations, technical information and economic impacts. As indicated in Table 1, the emission of CO, NO_x, SO_2, HC and TSP are significant. For a number of reasons NO_x has been signaled out as the only pollutant reviewed in detail. Only potential reductions in emission must be considered under BACT. The SO_2 emissions are already reduced as much as practical with the use of 0.5% S No. 2 fuel oil rather than a higher S content fuel. Reductions in SO_2 or TSP emissions typically require post-combustion control equipment. There are no known acid gas scrubber or particulate collection installation on diesel engines. A review of BACT Clearinghouse determinations indicates that the expected CO and HC emissions are typical for diesel engines. In particular, the values are equal to those for Sebring, Florida. Three determinations in California and Texas were lower but are expected since natural gas was the fuel.

In 1979 EPA proposed NSPS for NO_x emissions from diesel engines at a level of 8 gm/hp-hr, corresponding to approximately a 40 percent decrease from uncontrolled emissions. Excerpts from the NSPS document (attached) are particularly enlightening: A reduction in NO_x emissions is expected to be accompanied by an increase in CO and HC emissions, but could be achieved with design specifications rather than add-on equipment. NO_x emissions are high priority and relatively large from diesel engines. In general, NO_x emissions reductions are harder to achieve than CO and HC emission reductions, which can better be achieved from other sources. Timing retardation results in an increase in smoke and fuel consumption. Timing retardation works by decreasing the air-to-fuel ratio, lowering the flame temperature, which reduces NO_x formation. Oxidizing catalysts for CO and HC emission reductions were considered unreasonably expensive, while reducing catalysts for NO_x reductions were both unproven and expensive relative to techniques of engine adjustment.

An EPA assessment of combustion modifications in 1982 (attached) indicates that operation adjustment has been demonstrated and both combustion system redesign and catalytic reduction has only been done at laboratory scale. Among the operation adjustments, ignition retardation has no serious drawbacks other than a fuel use penalty, exhaust gas recirculation requires new components with additional maintenance, and water injection can cause severe maintenance problems.

Information has been received from potential vendors relative to further NO_x reduction beyond that of the proposed NSPS, both without additional equipment and with selective catalytic reduction ("SCR"). CES has insisted that only guaranteed values be represented in this application which are expected to be 6 gm/hp-hr with additional timing retardation and 3 gm/hp-hr with SCR. Table 2 has been prepared to evaluate the economic consequences of these two levels at an assumed 8760 hours per year level of operations. At the level of 6 gm/hp-hr, additional annual expense of $820,000 is expected to compensate for heat rate and capacity derate penalties. In addition, an opacity in excess of 20 percent is anticipated. The incremental cost of capital is $1,580/T, well in excess of established criteria for BACT. At the level of 3 gm/hp-hr, additional annual expense of $800,000 is expected to amortize equipment, replace catalyst, provide ammonia and replacement power during catalyst cleaning. In addition, SCR is only proven on gas-fired engines, catalyst poisoning could potentially greatly increase the replacement cost, an ammonia plume is possible and the SCR unit must be bypassed for approximately 10 minutes at startup and shutdown. The incremental cost of control is $610/T, which is not as persuasive as the operating considerations in not selecting SCR as BACT. DER, in its Intent to Issue the variance extension for the Key West Steam Units, agreed that $200,000 in construction costs and $47,000 per year in operation and maintenance costs are an unreasonable hardship for the people of Key West.

In light of these economic and other constraints relative to the further reduced NO_x emissions levels, CES believes that BACT for NO_x is 8 gm/hp-hr.

Two other considerations are necessary for the BACT analysis; i.e. other potential source types with lower NO_x emissions and unregulated pollutants which should be accounted for in deciding if BACT for regulated pollutants is appropriate as mandated by the June 3, 1987 North County remand. CES' power supply study considered 12 options of which the second choice in terms of lowest cumulative percent value cost was an equivalent-sized gas turbine. The primary difference between the gas turbine and the selected diesel generators were lower capital cost ($675/kW versus $1250/kW), higher full-load heat rate (13,600 Btu/kWh versus 8,500 Btu/kWh), greater increase in heat-rate at part-load, and less reliability of a single unit (compared to two diesel generators). However, it is recognized that the gas turbine option would have an NSPS emission rate of approximately 1.3 gm/hp-hr. An economic analysis for the gas turbine system would result in similar results to those for additional timing retardation on the diesel generators. For these reasons, CES believes that consideration of the gas turbine option has no effect on the proposed BACT.

Table 13 was prepared from reference information on emission inventories and control technologies for toxic pollutants. Of the 16 pollutants associated with the SIC category for electric utilities, only seven have identified emission rates for oil-firing. None of the three pollutants for which significant emission rates have been identified have significant emissions requiring BACT review for the diesel generators. For the various categories of pollutants, control technologies and associated problems have been identified. For organic vapors, thermal incineration is possible which requires auxiliary fuel. For inorganic vapors, carbon adsorption is possible which is not effective at low toxic concentrations in the flue gas. For both organic and inorganic particulate, venturi scrubbing is possible which entails substantial pressure drop and plume cooling. Since none of the control techniques has been implemented as diesel generators, CES believes that consideration of unregulated pollutants has no effect on the proposed BACT.

IMPACT ANALYSIS

The air quality impact of the diesel generator is related to the emission rate of various pollutants, the stack parameters (including height, flow rate and temperature), meteorology and size of the site. Greater impacts are associated with greater emission rate, smaller stacks, lower flow rates and temperatures, more unstable atmospheric conditions and smaller sites. Because of the small size of the Stock Island site, accountable impacts can occur as close as 0.1 km from the source.

Meteorological data from Miami was supplied by DER and consisted of hourly data from 1981-1985 for wind direction, wind speed, mixing height, temperature and atmospheric stability. Wind rose statistics have been computed from the information and are presented in Table 3. As can be seen from the data, prevailing winds are from the ENE through SE, which results in impacts to the west and northwest. It is also noted that extremely unstable conditions, stability class A are relatively infrequent.

A contract was awarded to Fairbanks Morse Engine Division on June 23, 1988. Relative to actual vendor data (see attachments to DER Form 17-1.(202)(1)), conservative values for stack and emission parameters based on fuel characteristics, capacity and heat rate have been used for impacts analysis and are presented in Table 4. Values for excess air of 100 percent and exhaust temperature of 600°F have been utilized in the modeling, while emissions have been based on a heat input of 100 MMBtu/hr. The stack height was set at 100 feet, equal to that of the Stock Island steam unit and 2.5 times the expected building height. It is noted that approximately 200 percent excess air results in the standard conditions of the proposed NSPS and, at that flow rate, the NO_x concentration is approximately 600 ppm.

Value of stack and emission parameters for the other major sources in Key West are presented in Table 5, along with their relative locations (refer to attached figure with 5 km grid). In addition to source locations on Key West, discrete receptors have been identified in Everglades National Park (refer to attached Figure with 100 km gird).

The modeling protocol is outlined in Table 6. The PTPLU model which analyzes an entire range of hypothetical meteorology was run as an initial step in determining the approximate magnitude and location of peak 1-hour impacts. Two other purposes have been to identify the expected locations of maximum interaction (downwind from sources with maximum impact) and the adequacy of background monitoring data. The ISCST model was utilized with real meteorology to predict ground level concentrations for specified averaging time and to accumulate information on worst case meteorology. An increasingly sophisticated modeling approach was defined. The four-step procedure involved the use of complete meteorology with a coarse receptor grid to identify possible worst-case locations and meteorology (20 highest impact days and grid locations used for each short-term averaging period), limited polar grid and complete meteorology to determine annual-average impacts, selected meteorology with a refined (increments of 0.1 km) receptor grid to determine short-term worst-case impacts and selected receptors in the Class I area and complete meteorology to determine worst-case impacts. Step One utilized a polar grid with receptors at 10° intervals and geometric downwind distances of 0.25, 0.5, 1.0, 2.0, and 4.0 km. Step Two utilized a polar grid (directions 280° to 300° and distances of 1.0 and 2.0 km). In Step Three, three grids were selected for short-term impact prediction based on typical locations in Step One. For 1- and 3-hour concentrations these were 1.0 km on a side, with the W grid centered at -1.5, 0.0, the NW grid centered t -1.0, 1.0 and the N grid centered at 0.0, 1.0. For 24-hour concentrations, the W and N grids were 1.0 km on a side centered at -1.5, 0.0 and 0.0, 1.5, respectively, while the NW grid was 1.5 km on a side centered at -1.5, 1.5. Step Four utilized six discrete receptors (directions 10° to 60°) in Everglades National Park.

Table 7 indicates the PTPLU results for the six sources which were analyzed. With the exception of the gas turbine, all the locations of maximum impact for expected meteorological condition contributing to both short-term and annual-average impact (stabilities A to D) in the local area are in the range from 0.5 to 2.0 km. The impacts from the gas turbine are also relatively insignificant compared to those of the other sources. The various sources were taken into consideration in order of their maximum impact, to determine the modeling strategy. The three Key West steam units have the largest impact but, due to their retirement concurrent with startup of the diesel generator, are not expected to be accountable in terms of compliance with NAAQS. Next is the Stock Island steam unit which has maximum impact locations and conditions very similar to those of the diesel generators. Evaluating the Stock Island steam unit impacts relative to background values it is apparent that the only substantial impact which needs to be accounted in tracking compliance with NAAQS is that for SO_2. Thus compliance with NAAQS was based on interaction between the diesel generators and the Stock Island steam unit. Compliance with PSD increments was based on interaction between the diesel generators and the Key West sources, although only annual-average Class II interaction was anticipated, while both short-term and annual-average Class I interaction was anticipated.

Table 8 presents the results of Step Two and Step Four modeling for the diesel generators with indication of responsible meteorology and variability over the 5-year data set. The highest of the second-high values were utilized directly in the compliance analysis for SO_2 and pro-rated on the basis of emissions for other parameters. Maximum impacts were assured at locations not on the edge of respective grids. As expected all maximum impact directions correspond with prevailing wind directions and meteorology for maximum short-term impacts has a frequency of occurrence on the order of 1 percent.

Table 11 presents the results of Step Five modeling for the diesel generators with indication of responsible meteorology and variability over the 5-year data set. The highest of the second-high values were utilized directly in the compliance analysis for SO_2 and pro-rated on the basis of emissions for other parameters. The location of the Class I area and the downwind distance have predetermined that maximum impacts will be associated with stable meteorology and will not be as high as those in the prevailing wind direction. As expected, the responsible wind speeds have the predominate frequency of occurrence on the order of 0.5 percent.

Table 9 presents the combination of background air quality, impact of diesel generators and SO_2 interaction with the Stock Island steam unit. As the values indicate, compliance with NAAQS is achieved for all the criteria pollutants.

It is noted that EPA finalized the PM-10 standard for TSP on July 1, 1987 which reduced the NAAQS values to 150 and 50 ug/m^3 on a 24-hour and annual average basis, respectively, and considers only particulate in the size range equal to or less than 10 ppm.

Table 10 presents the increment consumption of the diesel generators and Key West gas turbine, and increment expansion at that location due to the retirement of the Key West steam units. Both Class II (nearby) and Class I (Everglades National Park) increment consumption are within allowable standards. DER staff has indicated that consideration of Class I interaction with sources from other Florida locations is not necessary.

The currently available version of the ISCST model was also run with EPA-suggested meteorology (20 hours of various stability and windspeed conditions) in the building downwash analysis mode using dimensions of the various buildings (80' x 80' x 40' high for the diesel generators, 110' x 80' x 70' high for the Stock Island steam unit and 280' x 110' x 60' high for the Key West steam units and gas turbine). The downwash results for a 1-hour peak impact were no greater than those in Step One for the diesel generators and Key West steam units. For the Key West gas turbine values were substantially higher under three different meteorological scenarios: stability class 4 and 10 m/sec windspeed, stability class 4 and 20 m/sec windspeed, and stability class 3 and 10 m/sec windspeed. None of these conditions is expected to play a role in impact analysis relative to Class II short-term standards due to their very low probability of occurrence. For the Stock Island steam unit values were higher under six different meteorological scenarios: stability class 4 and 10 m/sec windspeed, stability Class 6 and 5 m/sec windspeed, stability class 4 and 20 m/sec windspeed, stability class 5 and 5 m/sec windspeed, stability class 3 and 10 m/sec windspeed, and stability class 1 and 1 m/sec windspeed. None of these conditions are expected to play a role in impact analysis relative to Class II short-term standards due to their very low probability of occurrence.

AMBIENT MONITORING

If predicted impacts from a new source are large and if no other representative data are available, pre-application ambient monitoring is required. DER regulations specify de minimus levels of impacts, below which no ambient monitoring is required. As indicated in Table 1, the diesel generators have de minimus impacts.

OTHER IMPACTS

The diesel generators are replacing steam units at the Key West plant which are being retired due to environmental considerations. The net reduction in capacity is being offset by a new 50-MW capable tie-line to the mainland, which will supply base-load power for Key West. No additional population growth is expected related to the diesel generators.

No specific analyses have been performed relative to impact on soils and vegetation. It is expected that compliance with NAAQS also protects these resources. Analysis has been performed, however, of the visibility impact on the Everglades National Parks.

LEVEL-1 VISIBILITY ANALYSIS

A level-1 visibility screening analysis is designed to evaluate three contrast parameters: (i) plume contrast against the sky, (ii) plume contrast against terrain and (iii) change in sky/terrain contrast caused by primary and secondary aerosol. If the absolute value of each contrast parameter is less than 0.10 the emission source passes the level-1 visibility screening test and no further analysis is required.

The first two parameters, plume contrast against the sky and plume contrast against terrain, deal primarily with the impacts from particulate and NO_x emissions. Due to the fact that visual impact from particulate and NO_x emissions are greatest when plume material is concentrated, light-wind conditions with a 12-hour transport time to the closest Class I area were assumed. Calculated values for sky/plume and terrain/plume contrast were 0.0037 and 0.00011 respectively. Change in sky/terrain contrast caused by primary and secondary aerosol involves consideration of both particulate and SO_2 conversion to sulfate. Since sulfate forms slowly in the atmosphere, the maximum impact does not occur close to the source. Thus, for the level-1 analysis, sulfate impacts were evaluated at a distance of 350 km from the source, the equivalent of two days transport time at an assumed 2 m/s wind speed. The value calculated for contrast reduction caused by sulfate aerosol and particulate emissions during a stagnation episode was 0.00026.

Since each of the three calculations produced results less than 0.10, further analysis of potential visibility impacts were unnecessary. The input parameters and calculations are shown in Table 12.

(1159F)

REFERENCES

U.S. Environmental Protection Agency, July 23, 1979. "Proposed Rules, Stationary Internal Combustion Engines; Standards of Performance for New Stationary Sources."

U.S. Environmental Protection Agency, November 1980. "Workbook for Estimating Visibility Impairment."

U.S. Environmental Protection Agency, July, 1982. "Project Summary, Environmental Assessment of Combustion Modification Controls for Stationary Internal Combustion Engines" (attached).

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Standards and Engineering Division, June, 1985. "BACT/LAER Clearinghouse -- A Compilation of Control Technology Determinations."

U.S Environmental Protection Agency, Office of Air Quality Planning and Standards, Monitoring and Data Analysis Division, July, 1986. "Compiling Air Toxics Emission Inventories."

U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Emissions Standards and Engineering Division, May, 1986. "BACT/LAER Clearinghouse -- A Compilation of Control Technology Determinations." First Supplement to 1985 Edition.

U.S. Environmental Protection Agency, Office of Research and Development, September 1986. "Handbook of Control Technologies for Hazardous Air Pollutants."

U.S. Environmental Protection Agency, office of Air Quality Planning and Standards, Emission Standards and Engineering Division, June, 1987. "BACT/LAER Clearinghouse - "A Compilation of Control Technology Determinations, Second Supplement to 1985 Edition."

U.S. Environmental Protection Agency, February 8, 1988. "Proposed Rule, Prevention of Significant Deterioration for Nitrogen Oxides.

Robert W. Cooper, June, 1988. "The Cost Impacts of Environmental Regulations on Gas Turbine and Internal Combustion Engine Based Cogenerators." Paper presented at the 1988 Cogeneratin Congress (attached).

TABLE 1

SIGNIFICANT EMISSIONS, MODELING RESULTS AND DE MINIMUS IMPACTS

Pollutant	Significant Emission (TPY)	Actual Emission (TPY)
CO	100	520
NO_x	40	2,100
SO_2	40	440
O_3	40 (1)	260 (2)
TSP	25	90

(1) Value actually for HC.

(2) Additional amount from two 500,000 storage tanks = 14.

Modeling Results at 100 lb/hr

Averaging Time (hr)	Impact (ug/m^3)
1	34
3	27
24	.95 9.5
8,760	1.2

Pollutant	De Minimus Impact (ug/m^3)	De Minimus Average Time (hr)	Actual Emission (lb/hr)	Actual Impact (ug/m^3)
NO_x	14	8,760	470 479	5.6
CO	575	8	120 118.7	32 (3)
SO_2	13	24	100 100.5	9.5
TSP	10	24	20 20.5	2

(3) Conservative value actually for 3-hour impact.

TABLE 2

BACT ECONOMIC ANALYSIS FOR NO_x

Emission (gm/hp-hr)	8	6	3
Total Annual Cost ($)	base	820,000	800,000
Annual Emission (TPY)	2,100	1,580	790
Incremental Emission Reduction (TPY)	base	520	1,310
Incremental Cost ($/T)	base	1,580	610
Heat Rate Penalty (Btu/kWh)	base	1,000	0
Annual Cost ($)	base	700,000	0
Capacity Derate Penalty (MW)	base	1.6	0
- Annual Cost ($)	base	120,000	0
Additional Equipment Cost ($)	0	0	2,000,000
- Annual Cost ($)	0	0	180,000
Catalyst Replacement (%/yr)	0	0	20
- Annual Cost ($)	0	0	400,000
Ammonia Use (lb/NH_3/lb NO_x removed)	0	0	0.6
- Annual Cost ($)	0	0	160,000
Downtime (hr/mo)	0	0	24
- Annual Cost ($)	0	0	60,000
Total Annual Cost ($)	0	820,000	800,000

Assumptions:

1- 6 gm/hp-hr emission achieved with timing retardation.
2- 3 gm/hp-hr emission achieved with Selective Catalytic Reduction.
3- 10 Percent heat rate penalty associated with timing retardation.
4 - Fuel cost of $4/MMBtu in 1988.
5- 8 Percent derate penalty associated with timing retardation.
6 - Capital cost of $800/kW amortized at 9% per year.
7 - SCR capital cost of $75/hp amortized at 9% per year.
8 - SCR catalyst replacement proportional to capital cost.
9 - Ammonia cost of $200/T.
10 - Power replacement at incremental heat rate of 2500 Btu/kWh and fuel cost of $4/MMBtu in 1988.

TABLE 3

MIAMI
FIVE YEAR WINDROSE
1981 - 1985

STABILITY CLASS 1 .43%

SPEED	N .02	NNE .01	NE .02	ENE .01	E .01	ESE .04	SE .07	SSE .06	S .06	SSW .01	SW .02	WSW .01	W .02	WNW .04	NW .03	NNW .02
ws<=1	.00	.00	.00	.00	.00	.00	.01	.00	.01	.01	.00	.00	.00	.01	.00	.00
1> ws< 3	.01	.01	.02	.01	.01	.04	.07	.05	.05	.00	.02	.01	.01	.03	.02	.01
3>=ws> 5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

STABILITY CLASS 2 5.77%

SPEED	N .26	NNE .21	NE .21	ENE .36	E .46	ESE .80	SE 1.00	SSE .67	S .30	SSW .15	SW .20	WSW .18	W .18	WNW .18	NW .31	NNW .29
ws<=1	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
1> ws< 3	.10	.07	.07	.07	.08	.14	.15	.15	.09	.06	.10	.08	.08	.08	.11	.09
3>=ws> 5	.15	.14	.13	.29	.37	.65	.83	.51	.21	.09	.10	.10	.09	.10	.20	.20
5>=ws> 7	.00	.00	.00	.00	.01	.01	.02	.01	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

STABILITY CLASS 3 15.41%

SPEED	N .87	NNE .55	NE .63	ENE 1.31	E 1.76	ESE 2.30	SE 2.69	SSE 1.57	S .67	SSW .33	SW .32	WSW .26	W .35	WNW .38	NW .62	NNW .80
ws<=1	.02	.02	.00	.00	.00	.00	.01	.00	.00	.01	.01	.00	.00	.01	.00	.02
1> ws< 3	.14	.13	.08	.10	.12	.15	.18	.20	.13	.07	.08	.08	.08	.11	.13	.13
3>=ws> 5	.55	.27	.31	.50	.73	.98	1.15	.79	.31	.15	.14	.11	.14	.16	.32	.47
5>=ws> 7	.16	.12	.20	.60	.76	1.02	1.26	.53	.21	.09	.07	.06	.10	.09	.15	.18
7>=ws> 9	.00	.01	.02	.08	.13	.12	.08	.04	.01	.00	.01	.01	.02	.01	.01	.00
9>=ws> 999	.00	.00	.02	.02	.01	.01	.01	.00	.01	.01	.01	.00	.01	.00	.01	.00

STABILITY CLASS 4 38.43%

SPEED	N 2.71	NNE 1.21	NE 2.59	ENE 4.84	E 5.41	ESE 5.45	SE 4.29	SSE 2.29	S 1.26	SSW .79	SW .85	WSW .72	W .79	WNW .91	NW 1.62	NNW 2.69
ws<=1	.01	.02	.00	.00	.01	.01	.02	.00	.01	.00	.01	.01	.01	.01	.03	.04
1> ws< 3	.41	.21	.18	.16	.19	.26	.22	.29	.20	.10	.11	.09	.08	.13	.22	.29
3>=ws> 5	.94	.46	.51	1.01	1.23	1.31	1.12	.78	.53	.27	.26	.18	.22	.26	.45	.78
5>=ws> 7	.93	.40	1.15	2.16	2.56	2.53	2.04	.90	.41	.25	.28	.22	.26	.25	.58	1.03
7>=ws> 9	.39	.11	.61	1.28	1.20	1.13	.80	.26	.09	.12	.12	.16	.13	.15	.24	.46
9>=ws> 999	.03	.02	.15	.23	.22	.22	.09	.05	.03	.05	.08	.06	.08	.11	.10	.09

STABILITY CLASS 5 18.87%

SPEED	N 1.87	NNE .81	NE 1.05	ENE 1.81	E 2.54	ESE 2.52	SE 1.56	SSE 1.04	S .68	SSW .50	SW .46	WSW .41	W .45	WNW .61	NW .81	NNW 1.74
ws<=1	.05	.02	.01	.02	.02	.02	.01	.01	.00	.02	.01	.01	.02	.01	.04	.05
1> ws< 3	.69	.38	.26	.34	.51	.54	.47	.44	.32	.24	.21	.18	.19	.19	.34	.70
3>=ws> 5	.97	.38	.63	1.20	1.64	1.63	.92	.54	.34	.22	.21	.20	.21	.36	.36	.83
5>=ws> 7	.15	.04	.15	.24	.38	.33	.15	.05	.02	.03	.02	.02	.03	.05	.08	.16
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

STABILITY CLASS 6 15.97%

SPEED	N 1.79	NNE .84	NE .68	ENE .90	E 1.58	ESE 1.90	SE .97	SSE .87	S .73	SSW .49	SW .65	WSW .50	W .58	WNW .56	NW 1.10	NNW 1.82
ws<=1	.11	.03	.03	.04	.04	.05	.04	.03	.03	.03	.04	.04	.05	.03	.06	.07
1> ws< 3	1.31	.63	.46	.58	1.05	1.31	.70	.68	.55	.36	.49	.38	.42	.40	.83	1.41
3>=ws> 5	.37	.18	.18	.28	.48	.53	.23	.16	.14	.10	.13	.09	.10	.13	.21	.34
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

STABILITY CLASS 7 5.12%

SPEED	N .63	NNE .21	NE .10	ENE .13	E .41	ESE .37	SE .32	SSE .36	S .26	SSW .21	SW .23	WSW .22	W .27	WNW .22	NW .46	NNW .72
ws<=1	.17	.06	.02	.03	.09	.11	.08	.10	.07	.07	.06	.05	.10	.04	.14	.17
1> ws< 3	.46	.16	.08	.10	.31	.26	.24	.25	.19	.14	.17	.16	.17	.18	.32	.55
3>=ws> 5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5>=ws> 7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7>=ws> 9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9>=ws> 999	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

	N	NNE	NE	ENE	E	ESE'	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
TOTAL	8.13	3.85	5.29	9.36	12.17	13.38	10.91	6.85	3.96	2.48	2.74	2.31	2.63	2.90	4.95	8.08

SPEED			
ws<=1	2.82	.00	
1> ws< 3	28.27	.57	
3>=ws> 5	35.83	1.43	
5>=ws> 7	23.52	1.41	
7>=ws> 9	7.83	.63	
9>=ws> 999	1.73	.17	
	100.00	4.21	average

Total number of hours = 43824.

TABLE 4

KEY WEST 10MW DIESEL
AIR QUALITY IMPACT ANALYSIS PARAMETERS

Data from RFP

No. 2 Fuel Oil	
Composition	(%)
Carbon	86
Hydrogen	13
Sulfur	0.5
	99.5
HHV(Btu/lb)	19500

Flue Gas	(moles)	(%EA) (%/ppm)	100 (moles)	(%EA) (%/ppm)	200 (moles)	(%EA) (%/ppm)
H20	6.50	12	6.50	6	6.50	4
CO2	7.17	13	7.17	7	7.17	4
O2	0.00	0	10.42	10	20.83	13
N2	41.67	75	83.33	78	125.00	78
SO2	0.02	282	0.02	145	0.02	98
	55.35		107.43		159.52	

(per 100 lb No. 2 Fuel Oil)

Stack Parameters

Capacity (MW)	10
Heat Rate (Btu/Kwh)	10000
Heat input (mmBtu/h)	100
Excess Air(%)	100
Flue Gas Temp(F)	600
FlueGas Flow(acfm)	70427
Stack Height(ft)	100
Stack Velocity(ft/sec)	100
Stack Diameter(ft)	4

Emission Parameters		(lb/hr)
TSP (lb/mmBtu)	0.1	10
SO2 (lb/mmBtu)	0.5	50
CO (gm/hphr)	2	59
NOx (gm/hphr)	8	235
HC (gm/hphr)	1	29

TABLE 5

SOURCE PARAMETERS AND EVERGLADES RECEPTOR COORDINATES

Source	SO_2 Emission (lb/hr)	Height (ft)	Stack Temperature (°F)	Velocity (ft/sec)	Diameter (ft)	UTM Coordinates (km E)	UTM Coordinates (km N)	Receptor Designation	UTM Coordinates (km E)	UTM Coordinates (km N)	SI Distance (km)	
New Diesels	100	100	600	100	4	425.7	2716.6	Everglades at 10°	448	2862	148	147
KW Steam #3	408 (1)	150	284	16	8	419.1	2716.6	Everglades at 20°	472	2848	140	141.6
KW Steam #4	350 (1)	150	252	15	8	419.1	2716.6	Everglades at 30°	486	2822	122	124.8
KW Steam #5	325 (1)	150	282	28	8	419.1	2716.6	Everglades at 40°	486	2794	99	102.3
KW Gas Turbine	173 (2)	35	910	150	12	419.1	2716.6	Everglades at 50°	500	2782	100	104.
SI Steam	1195 (3)	104	369	147	5	425.7	2716.7	Everglades at 60°	504	2764	92	91.5

(1) SO_2 at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NO_x at 0.7 lb/MMBtu.

(2) SO_2 at 0.5 lb/MMBtu, TSP at 0.04 lb/MMBtu, NO_x at 0.3 lb/MMBtu.

(3) SO_2 at 2.75 lb/MMBtu, TSP at 0.1 lb/MMBtu, NO_x at 0.7 lb/MMBtu.

TABLE 6

MODELING PROTOCOL

Step	Model	Sources	Receptors	Meterology	Results
1	PTPLU	Diesels KW Steam KW Gas Turbine SI Steam	-- -- -- --	-- -- -- --	Location of maximum impact, maximum interaction, adequacy of back-ground.
2	ISCST	Diesels	Polar grid, Geometric Spacing	81-85 hourly	Potential Class II worst-case receptor areas and meterology.
3	ISCST	Diesels KW Steam KW Gas Turbine SI Steam	Limited polar grid	81-85 hourly	Class II annual-average impacts, AAQS interaction, CLASS II increment expansion, CLASS II interaction.
4	ISCST	Diesels SI Steam KW Steam KW Gas Turbine	Rectangular grid, 0.1 km spacing	Selected 81-85	Class II short-term impacts, AAQS interaction, Class II increment expansion, Class II interaction.
5	ISCST	Diesels KW Steam KW Gas Turbine	Everglades	81-85 hourly	Class I impacts, Class I increment expansion, Class I interaction

TABLE 7

PTPLU RESULTS

Source	SO_2 Emission (lb/hr)	Maximum Impacts Windspeed and Location for Various Stability					
		A (ug/m³) (m/sec) (km)	B (ug/m³) (m/sec) (km)	C (ug/m³) (m/sec) (km)	D (ug/m³) (m/sec) (km)	E (ug/m³) (m/sec) (km)	F (ug/m³) (m/sec) (km)
Diesel Generators	100	35	31	34	26	20	15
		3.0	5.0	12.	20.	2.0	2.0
		0.6	0.7	0.7	1.0	5	10
KW Steam #3	408	258	209	203	138	86	58
		2.0	3.0	5.0	7.0	2.0	2.0
		0.5	0.7	0.9	1.5	5	9
KW Steam #4	350	253	207	197	134	81	55
		1.5	3.0	4.0	5.0	2.0	2.0
		0.5	0.7	0.9	1.7	5	9
KW Steam #5	325	135	110	105	71	51	32
		3.0	5.0	7.0	10	2.0	2.0
		0.5	0.7	0.9	1.5	6	12
KW Gas Turbine	173	5.9	4.0	7.8	5.7	6.1	4.4
		3.0	5.0	15.	20.	2.0	2.0
		1.2	2.7	1.8	3.2	20	15
SI Steam	1195	279	237	285	211	163	119
		3.0	5.0	15	20	2.0	2.0
		0.6	0.9	0.7	1.2	7	13

TABLE 8

CLASS II IMPACTS OF DIESEL GENERATORS
WITH 100 LB/HR EMISSION RATE

Annual Average

Year	Impact (ug/m^3)	Location Distance (km)	Location Direction (deg)
1981	1.0	2	300
1982	1.2	2	300
1983	1.2	1	300
1984	1.0	1	300
1985	0.8	2	280

1-Hour

Year	Grid	2nd/High Impact (ug/m^3)	Location E (km)	Location N (km)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
	N								
1981		33	-0.3	0.9	151	13	3	7	1
1982		30	0.0	1.0	174	11	2	3.5	1
1983		--	--	--	--	--	--	--	--
1984		--	--	--	--	--	--	--	--
1985		--	--	--	--	--	--	--	--
	W								
1981		34	-0.8	-0.3	168	13	3	7	1
1982		32	-0.9	-0.3	113	13	3	6.5	1
1983		33	-0.9	0.0	103	11	3	7	1
1984		33	-0.9	-0.4	75	13	3	7.5	1
1985		32	-1.0	0.2	251	13	3	6.5	1
	NW								
1981		33	-0.9	0.5	165	13	3	7	1
1982		32	-0.9	0.5	155	13	3	6.5	1
1983		32	-0.9	0.5	182	14	3	7	1
1984		33	-0.6	0.7	202	12	3	6.5	1
1985		33	-0.6	0.7	152	14	3	7	1

TABLE 8

CLASS II IMPACTS OF DIESEL GENERATORS
WITH 100 LB/HR EMISSION RATE
(continued)

3-Hour

Year	Grid	2nd/High Impact	Location E (km)	Location N (km)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
	N								
1981		25	-0.3	0.9	239	10-12	3	7	2
1982		--	--	--	--	--	--	--	--
1983		--	--	--	--	--	--	--	--
1984		--	--	--	--	--	--	--	--
1985		--	--	--	--	--	--	--	--
	W								
1981		23	-1.0	0.2	176	10-12	3	5	2
1982		25	-1.1	-0.4	173	13-15	3	8	3
1983		27	-1.1	0.2	292	13-15	3	5	3
1984		26	-1.1	-0.4	261	10-12	3	5	3
1985		26	-0.9	0.3	233	13-15	2	4.5	3
	NW								
1981		23	-1.0	0.6	253	10-12	2	3	3
1982		27	-0.6	0.8	164	13-15	2	4.5	3
1983		26	-0.9	0.5	261	10-12	3	4.5	3
1984		25	-0.7	0.8	202	10-12	3	6	2
1985		25	-0.5	0.9	90	10-12	3	5	2

24-Hour

Year	Grid	2nd/High Impact	Location E (km)	Location N (km)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
	W								
1981		8.5	-1.4	0.2	101	--	4	7.5	12
1982		8.5	-1.4	0.4	360	--	4	6.5	13
1983		8.1	-1.2	0.2	185	--	4	4	11
1984		6.1	-1.4	0.1	266	--	4	8.5	6
1985		7.6	-1.4	0.6	1	--	4	7.5	9
	NW								
1981		9.5	-1.4	0.8	146	--	4	7.5	10
1982		7.8	-1.8	0.9	33	--	4	7.5	9
1983		7.5	-1.0	0.6	141	--	3	4.5	9
1984		7.5	-0.9	0.5	141	--	4	4	10
1985		7.6	-1.6	1.4	161	--	4	6	12

TABLE 9

COMPLIANCE WITH AAQS

Pollutant	Average Time (hr)	Standard (ug/m^3)	Background (ug/m^3) (1)	Two 10-MW Diesel Impact (ug/m^3)	Total (ug/m^3)
CO	8	10,000	5,500 (1)	31 (4)	5,531
	1	40,000	11,000	39 40	11,039
Pb	2,190	1.5	0.15	0.0001 (5)	0.15
NO_2	8,760	100	35	5.8	43.8
O_3	1	250	210 (2)	20 (6)	230
SO_2	8,760	60	15	1.2	25 (7)
	24	260	65	9.5	133.5 (7)
	3	1,300	325	27	545 (7)
TSP (8)	8,760	50	41 (3)	0.2 .24	41.2
	24	150	99 (3)	1.9	100.9

(1) Values for state-wide background level from:

State of Florida Department of Environmental Regulations Bureau of Air Quality Management, November, 1987 "Ambient Air Quality in Florida 1986."

(2) Value from Lee County.

(3) Value from Monroe County.

(4) Conservative value actually for 3-hour impact.

(5) Value actually for annual-average impact.

(6) Conservative value actually for HC, O_3 indeterminate.

(7) Includes interaction with Stock Island steam unit.

(8) Standard revised July 1, 1987 to consider only particles less than or equal to 10 um size.

TABLE 10

COMPLIANCE WITH PSD INCREMENTS

Pollutant	Average Time (hr)	Class II Standard (ug/m^3)	Two 10-MW Diesel Impact (ug/m^3)	Key West Gas Turbine Impact (ug/m^3)	Key West Steam Impact (ug/m^3)	Total (ug/m^3) (1)
SO_2	3	512	27	0	0	27
	24	91	9.5	0	0	9.5
	8,760	20	1.2	0	0.8	0.4
TSP	24	37	1.9	0	0	1.9
	8,760	19	0.2	0	0	0.2
NO_2	8,760	25	5.8	0	0.2	0.6

Pollutant	Average Time (hr)	Class I Standard (ug/m^3)	Two 10-MW Diesel Impact (ug/m^3)	Key West Gas Turbine Impact (ug/m^3)	Key West Steam Impact (ug/m^3)	Total (ug/m^3) (1)
SO_2	3	25	2.0	0.9	10.8	0
	24	5	0.3	0.3	2.4	0
	8,760	2	0.010	0.008	0.092	0
TSP	24	10	0.04	0.02	0.09	0
	8,760	5	0.002	0.001	0.003	0
NO_2	8,760	2.5	0.05	0.005	0.02	0.04

(1) Value equal to diesel impact + gas turbine impact - steam impact and negative numbers set equal to zero.

TABLE 11

CLASS I IMPACTS OF DIESEL GENERATORS
WITH 100 LB/HR EMISSION RATE

Annual Average

Year	Impact (ug/m^3)	UTM Coordinates (km E)	UTM Coordinates (km N)
1981	.008	486	2794
1982	.008	500	2782
1983	.009	500	2782
1984	.008	486	2794
1985	.010	504	2764

1-Hour

Year	2nd/High Impact (ug/m^3)	UTM Coordinates E (km E)	UTM Coordinates N (km N)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
1981	4.7	504	2764	283	5	7	1.5	1
1982	3.7	500	2782	175	24	7	1.5	1
1983	3.7	500	2282	242	6	7	1.5	1
1984	4.7	504	2764	308	2476	1.5	1	
1985	4.7	504	2764	141	23	6	1	1

3-Hour

Year	2nd/High Impact (ug/m^3)	UTM Coordinates E (km E)	UTM Coordinates N (km N)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
1981	1.4	500	2782	28	1-3	6	1.5	1
1982	1.9	486	2794	94	4-6	6	2.5	2
1983	1.6	500	2282	109	1-3	6	2.5	3
1984	2.0	486	2794	254	1-3	6	2	2
1985	1.9	500	2782	60	22-24	6	1.5	2

24-Hour

Year	2nd/High Impact (ug/m^3)	UTM Coordinates E (km E)	UTM Coordinates N (km N)	Meterology Day	Meterology Hour	Stability	Wind Speed (m/sec)	Persistence (hr)
1981	.24	500	2782	15	--	7	1.5	2
1982	.26	486	2794	93	--	6	2.5	2
1983	.27	500	2782	109	--	6	3.5	5
1984	.26	486	2794	254	--	5	2.5	3
1985	.29	500	2782	60	--	6	1.5	2

Table 12

Level-1 Visibility Analysis Calculations

TSP emission =	90 TPY =	0.22 metric ton/day
NO_x	2100	5.2
SO_2	440	1.1

$x = 90\ km$ distance from Key West to Everglades

$\sigma_z = 90\ m$

$r_{V0} = 40\ km$ background visual range

$$p = \frac{2 \times 10^8}{\sigma_z x} = \frac{2 \times 10^8}{90 \times 90} = 2.5 \times 10^4$$ plume dispersion parameter

$$\tau_{TSP} = 10 \times 10^{-7}\, p\, Q_{TSP} = 10 \times 10^{-7} \times 2.5 \times 10^4 \times 0.22 = 5.5 \times 10^{-3}$$

$$\tau_{NO_x} = 1.7 \times 10^{-7}\, p\, Q_{NO_x} = 1.7 \times 10^{-7} \times 2.5 \times 10^4 \times 5.2 = 2.2 \times 10^{-2}$$

optical thickness parameters

$$\tau_{aerosol} = 1.06 \times 10^{-5}\, r_{V0}\, (Q_{TSP} + 1.31\, Q_{SO_2})$$

$$= 1.06 \times 10^{-5} \times 40 \times (0.22 + 1.31 \times 1.1) = 7.0 \times 10^{-4}$$

$$C_1 = \frac{\tau_{NO_x}}{\tau_{TSP} + \tau_{NO_x}} \left[1 - e(-\tau_{TSP} - \tau_{NO_x})\right]\left(e^{-.78 \frac{x}{r_{V0}}}\right)$$

$$= \frac{2.2 \times 10^{-2}}{(5.5 \times 10^{-3} + 2.2 \times 10^{-2})} \left[1 - e(-5.5 \times 10^{-3} - 2.2 \times 10^{-2})\right]\left(e^{-.78 \times \left(\frac{90}{40}\right)}\right) = 3.7 \times 10^{-3}$$

$$C_2 = \left(1 - \frac{1}{C_1 + 1}\right) e(-\tau_{TSP} - \tau_{NO_2}) \left(e^{-1.56 \frac{x}{r_{V0}}}\right)$$

$$= \left(1 - \frac{1}{3.7 \times 10^{-3} + 1}\right) e(-5.5 \times 10^{-3} - 2.2 \times 10^{-2})\left(e^{-1.56 \frac{90}{40}}\right) = 1.1 \times 10^{-4}$$

$$C_3 = .368\left[1 - e(-\tau_{aerosol})\right] = .368\left[1 - e(-7.0 \times 10^{-4})\right] = 2.6 \times 10^{-4}$$

Reference: EPA Wkbk for Estimating Visibility Impairment EPA 450/4-80-031

TABLE 13

BACT ANALYSIS FOR AIR TOXICS

Pollutant	Type (4)	Emissions Factor	Significant Emission (TPY)	Actual Emission (TPY)	Possible Control (5)	Comment (6)
Formaldehyde	Ov	--	--	--	ti	af
Acetaldehyde	Ov	--	--	--	ti	af
Benzo (a) Pyrene	Ov	--	--	--	ti	af
PAH	Op	--	--	--	v	pd,pc
PCB	Ov	--	--	--	ti	af
Benzene	Ov	--	--	--	ti	af
POM	Op	0.000175(1)	---	0.001	v	pd,pc
Cd	ip	--	--	--	v	pd,pc
Hg	iv	0.002(1)	0.1	0.01	a	lc
Be	ip	0.000009(1)(3)	0.0004	0.0005	v	pd,pc
Mn	ip	--	--	--	v	pd,pc
Ni	ip	446 (2)	--	0.8	v	pd,pc
Cr	ip	55 (2)	--	0.1	v	pd,pc
As	ip	0.0007(1)(3)	--	0.004	v	pd,pc
Cu	ip	--	--	--	v	pd,pc
Pb	ip	0.008(1)(3)	0.6	0.05	v	pd,pc

(1) Value in lb/10^3 gal.

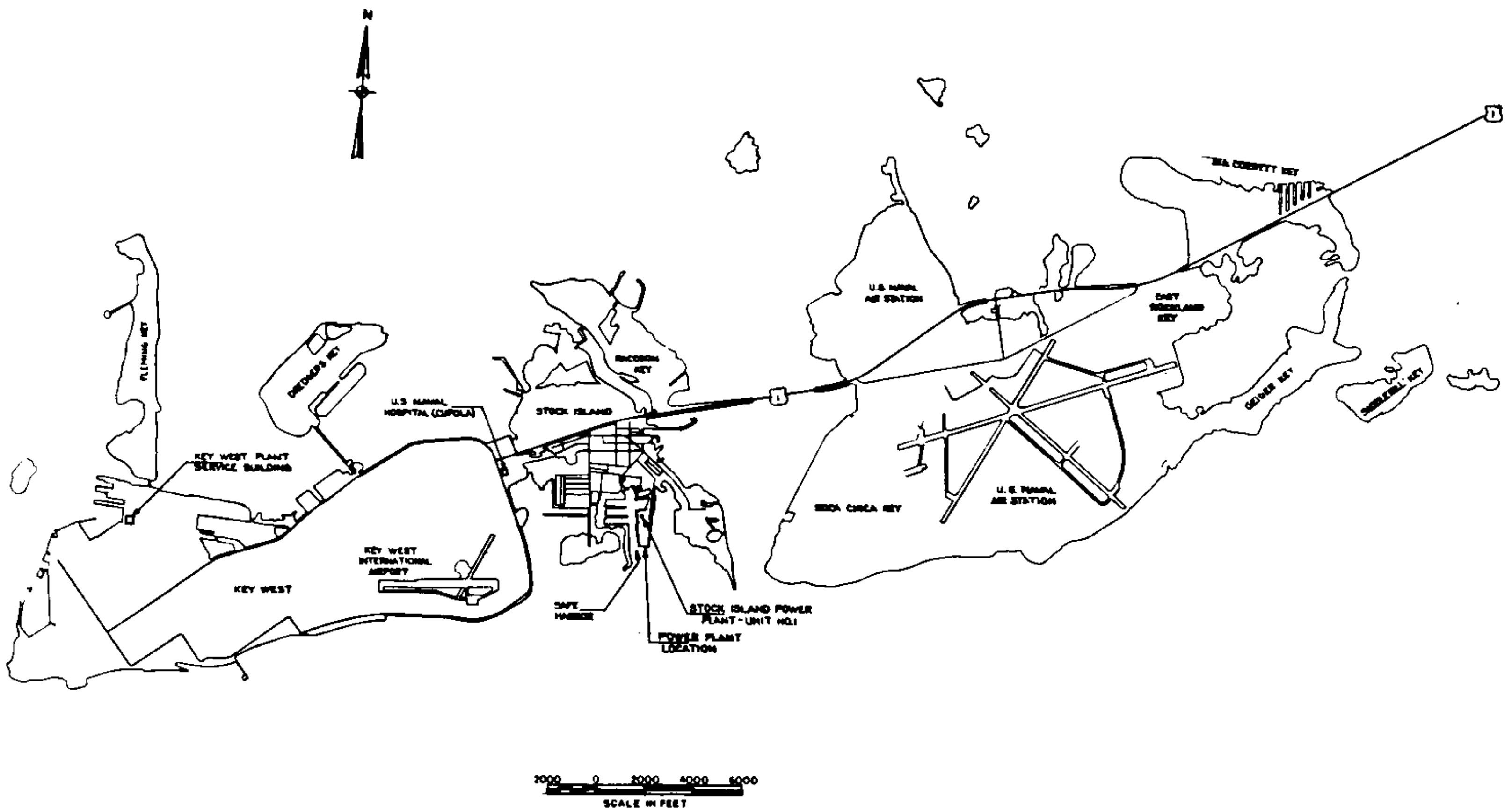
(2) Value in pg/J.

(3) Factor from PW Ventures determination.

(4) ov is organic vapor, op is organic particulate, iv is inorganic vapor, ip is inorganic particulate.

(5) ti is thermal incineration, a is carbon adsorption, v is venturi scrubber.

(6) af is auxiliary fuel, pd is pressure drop, pc is plume cooling, lc is low concentration of air toxic.



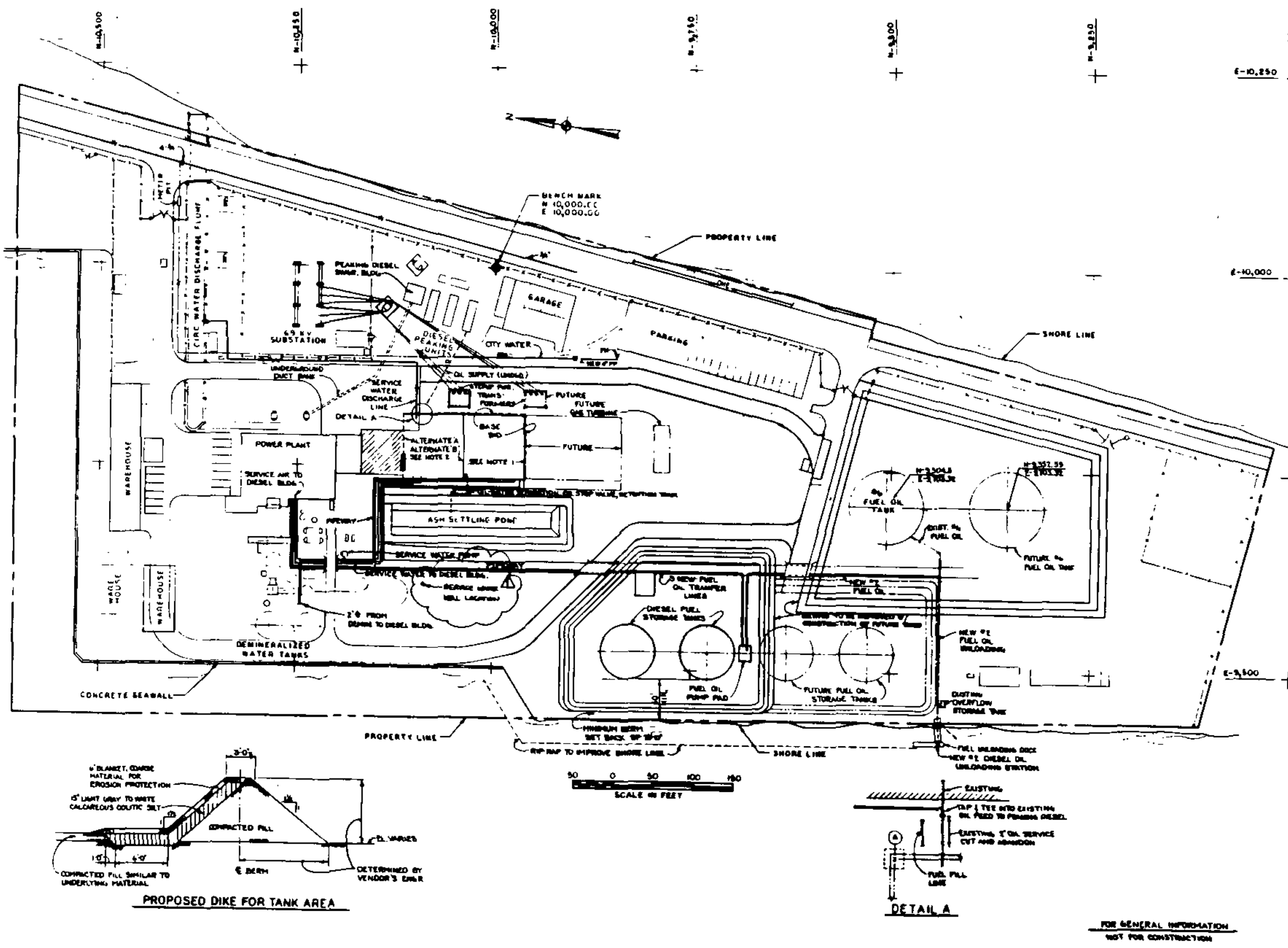
REVISIONS

R. W. BECK AND ASSOCIATES

STOCK ISLAND DIESEL GENERATING PLANT

VICINITY LOCATION MAP

2875-C-102.0



NOTES

1. - - - - - - - EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING, AND DIESEL DAY TANKS ON BASE BID
2. EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING, AND DIESEL DAY TANK FOR ALTERNATE AND ALTERNATE B
3. FOR INFORMATION ONLY, CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES.
4. FURNISH AND INSTALL UNDERGROUND DUCT BANKS BETWEEN DIESEL PLANT AND PEAKING DIESEL 15 KV SWITCHGEAR BUILDING, AND ANY OTHER LOCATIONS AS REQUIRED.

REVISIONS

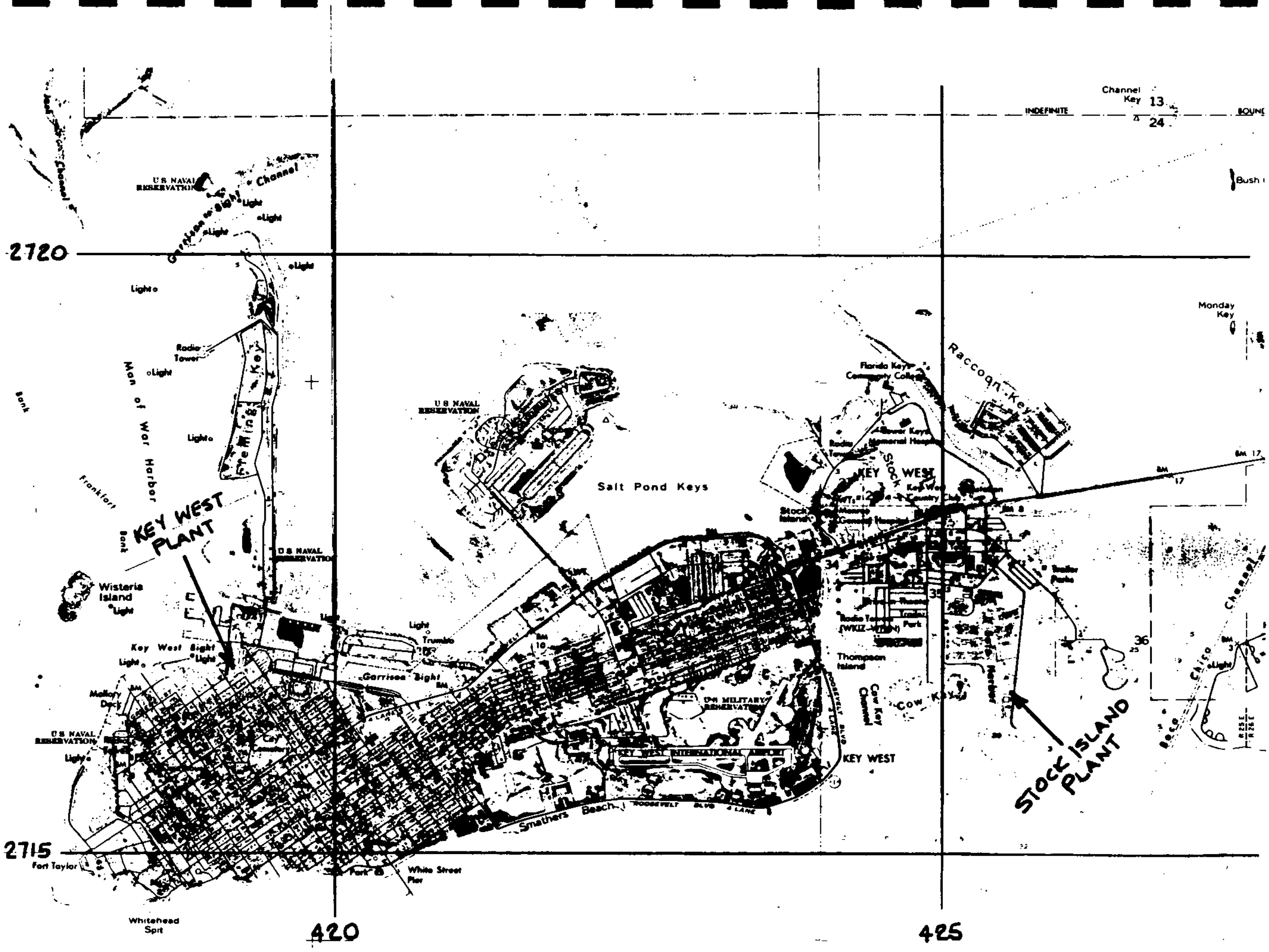
R. W. BECK AND ASSOCIATES

UTILITY BOARD OF THE CITY OF KEY WEST

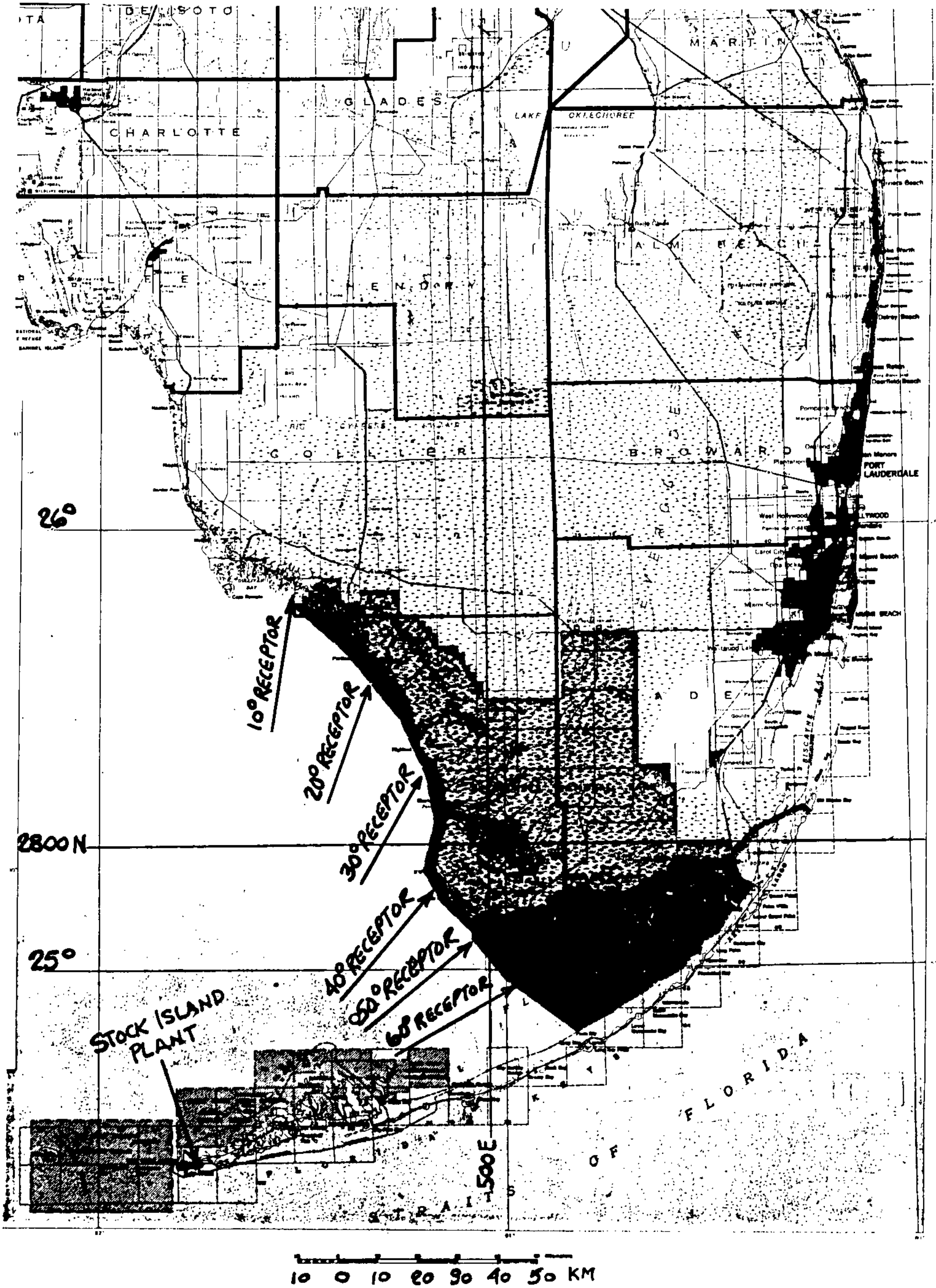
STOCK ISLAND DIESEL GENERATING PLANT

PROPOSED SITE PLAN AND UNDERGROUND UTILITIES

2875-C-104.1



2720
2715
420
425
KEY WEST PLANT
STOCK ISLAND PLANT
U S NAVAL RESERVATION
Man of War Harbor
Wisteria Island
Key West Bight
Garrison Bight
Salt Pond Keys
Raccoon Key
Stock Island
KEY WEST
Thompson Island
Cow Key
Cow Key Channel
Smathers Beach
KEY WEST INTERNATIONAL AIRPORT
U S MILITARY RESERVATION
Fort Taylor
Whitehead Spit
White Street Pier
Mallory Dock
Monday Key
Channel Key
Florida Keys Community College
Radio Tower
Light
INDEFINITE
Boca Chica Channel
Trailer Park
Frankfort Bank


DE SOTO
MARTIN
GLADES
CHARLOTTE
LAKE OKEECHOBEE
PALM BEACH
HENDRY
LEE
COLLIER
BROWARD
FORT LAUDERDALE
DADE
MONROE
STRAITS OF FLORIDA
26°
2800 N
25°
500 E
10° RECEPTOR
20° RECEPTOR
30° RECEPTOR
40° RECEPTOR
50° RECEPTOR
60° RECEPTOR
STOCK ISLAND PLANT
10 0 10 20 30 40 50 KM

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

#2000 pd. 7-15-88

AC 44-152197
AC 44-152198

SOUTH FLORIDA DISTRICT
2269 BAY STREET
FORT MYERS, FLORIDA 33901-2896
(813)332-2667

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Diesel Engine Generating Station [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Key West City Electric System COUNTY: Monroe

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) two diesel generators

SOURCE LOCATION: Street Front Street extended City Key West

UTM: East 425 North 2716

Latitude 24 ° 33 ' 49 "N Longitude 81 ° 44 ' 03 "W

APPLICANT NAME AND TITLE: Robert R. Padron, Manager

APPLICANT ADDRESS: 1006 James Street Key West, Florida 33041

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of City Electric System

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 contrc facilities in such a manner as to comply with the provision of Chapter 403, Florid Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferabl and I will promptly notify the department upon sale or legal transfer of the permitte establishment.

*Attach letter of authorization

Signed: [signature]

Robert R. Padron, Manager
Name and Title (Please Type)

Date: 7/12/88 Telephone No. (303) 294-5272

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 hav been designed/examined by me and found to be in conformity with modern engineerin principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

[1] See Florida Administrative 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 D. R. Swann

Dennis R. Swann
Name (Please Type)

R. W. Beck and Associates
Company Name (Please Type)

1125 17th Street, Ste. 1900 Denver, CO 80202
Mailing Address (Please Type)

Florida Registration No. 37459 Date: 7/7/88 Telephone No. (303) 295-6900

D. R. Swann 7/7/88

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.

The Utility Board of the City of Key West, Florida is planning to add two 10-MW diesel generators to their Stock Island plant, with an in-service date of February 1, 1990. Concurrent with this new source of generation will be the retirement of three existing 16.5-MW steam units at the Key West plant.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction 11/1/88 Completion of Construction 2/1/90

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.)

No post-combustion pollution control equipment is included with the diesel engines in the proposed BACT configuration.

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

Not Applicable

E. Requested permitted equipment operating time: hrs/day 24; days/wk 7; wks/yr 52;

if power plant, hrs/yr 8760; 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? NO

   a. If yes, has "offset" been applied? ______

   b. If yes, has "Lowest Achievable Emission Rate" been applied? ______

   c. If yes, list non-attainment pollutants. ______

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. YES

3. Does the State "Prevention of Significant Deterioriation" (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? NO

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.

2. See attachment labeled "BACT Analysis"
3. See attachment labeled "Impact Analysis"

PART 1 - PROCEDURES AND LEGAL

SECTION 103.05 - CONTRACT

THIS CONTRACT, executed this 23 day of JUNE 1988 by and between the **UTILITY BOARD OF THE CITY OF KEY WEST**, Key West, Florida hereinafter called **BUYER**, and **FAIRBANKS, MORSE ENGINE DIVISION, DIVISION OF COLT INDUSTRIES INC.** a business operating in Beloit, Wisconsin herein called **COLT INDUSTRIES.**

WITNESSETH:

That for the consideration and under the provisions hereinafter stated and referred to moving from each to the other of said parties respectively, it is mutually understood and agreed as follows:

1. That **COLT INDUSTRIES** is the lowest and best responsible bidder for supplying the requirements of **DIESEL ENGINE GENERATING STATION** for the City Electric System.

2. **COLT INDUSTRIES.** agrees to perform all aspects of this Contract set out by the **BUYER** in its **SPECIFICATIONS FOR DIESEL ENGINE GENERATING STATION** (Attached hereto and made part hereof as Exhibit A) and **PROPOSAL OF JUNE 7, 1988** (Attached hereto and made part hereof as Exhibit B) **AND MODIFICATION OF COLT INDUSTRIES BID DEVIATIONS** (Attached hereto and made a part hereof as Exhibit C).

2b. Wherever and whenever the provisions of this Document or attachments hereto conflict with the **SPECIFICATIONS OF BUYER FOR DIESEL ENGINE GENERATING STATION** (Exhibit A), **THE PROVISIONS OF SPECIFICATIONS OF BUYER FOR DIESEL ENGINE GENERATING STATION** (Exhibit A) **SHALL CONTROL.**

3. On the faithful performance of this Contract by **COLT INDUSTRIES. BUYER** will pay **COLT INDUSTRIES** in accordance with the terms and conditions stated in said proposal, award, specifications, and the Contract Documents hereinbefore specifically referred to and, by reference made a part hereof.

IN WITNESS WHEREOF, the parties hereto have duly executed this Contract in duplicate, the day and year first above written.

ATTEST:

[signature]

UTILITY BOARD OF THE CITY OF KEY WEST, FLORIDA

[signature]

(Chairman)

ATTEST:

[signature]

FAIRBANKS MORSE ENGINE DIVISION DIVISION OF COLT INDUSTRIES, INC.

[signature]

DIVISION 1, SECTION 01020 - GUARANTEES

Delete Section 01020.02, Paragraph a. and replace with the following Paragraph a.:

"a. Guarantee the following performance:

(1) (a) Net Electric Power Output, as stated by the Contractor in the Proposal.

(b) Net plant heat rate, as stated by the Contractor in the Proposal.

(c) Air Emissions:

1 Opacity:	20 percent
2 TSP:	0.1 lb/MMBtu
3 SO2:	0.5 lb/MMBtu
4 NOx:	8.0 gm/hp-hr
5 CO:	2.0 gm/hp-hr
6 HC:	1.0 gm/hp-hr

(d) Water:

1 Oil and Grease:	5 mg/l (daily maximum)
2 TSS:	30 mg/l (daily average), 100 mg/l (daily maximum)
3 Copper:	0.015 mg/l
4 Iron:	0.3 mg/l
5 pH:	6.5 to 8.5

(e) Noise emission: 55 dBA at L10 and 60 dBA at LMAX at the property line. Reference Monroe County Code.

(2) (a) Net Electric Power Output at 8700 KW

(b) Net plant heat rate at 9700 Btu/Net kWh

(c) Air Emissions:

1 Opacity: 31.0 percent

2 TSP: 0.1 lb/MMBtu

3 SO2: 0.5 lb/MMBtu

4 NOx: 6.0 gm/hp-hr

5 CO: 2.0 gm/hp-hr

6 HC: 1.0 gm/hp-hr

(d) Water:

1 Oil and Grease:	5 mg/l (daily maximum)
2 TSS:	30 mg/l (daily average), 100 mg/l (daily maximum)
3 Copper:	0.015 mg/l
4 Iron:	0.3 mg/l
5 pH:	6.5 to 8.5

(e) Noise emission: 55 dBA at L10 and 60 dBA at LMAX at the property line. Reference Monroe County Code.

16. As to Deviation Number 16, Colt and CES agree Section 15606.02 as contained in CES Bid Specification Number 35-88 shall stand as an agreed contract provision.

17. As to Deviation Number 17, Colt and CES agree that Deviation Number 17 be replaced and the following accepted as a contract provision.

DIVISION 15, SECTION 15650 - COOLANT LOOP HEAT EXCHANGERS

Delete Section 15650.04, Paragraph a. and replace with the following Paragraph a.:

"a. Type: Plate and Frame"

Delete Section 15650.04, Paragraph d., Subparagraphs (1) and (2) and replace with the following:

"(1) Plate: Titanium

18. As to Deviation Number 18, Colt and CES agree that

SECTION 301 - SPECIAL INSTRUCTIONS TO BIDDERS

301.07 BID DATA TO BE SUPPLIED BY VENDOR

In addition to other data and descriptive materia[illegible] with the Bidder's Proposal, the Bidder shall fill in all spaces of the following Bid Data Section:

1. Unit Rating and Guaranteed Performance Data:

(a) Gross output at the generator terminals: 9605 kW.

(b) Net electric power output, including all auxiliary loads: 9497 kW.

(c) List auxiliary equipment load:

Quantity	Equipment Name	Load (kW)
1	Service Water Pump	63.0
1	Jacket Water Pump	29.0
1	Intercooler Water Pump	12.5
1	Rocker Lube Pump	1.6
1	Injection Nozzle Cooling Pump	1.6
	Total	107.7

(d) Gross Heat Rate (LHV): 8090 Btu/kWh.

(e) Gross Heat Rate (HHV): 8605 Btu/kWh.

(f) Net Heat Rate (LHV): 8180 Btu/net kWh.

(g) Net Heat Rate, including all auxiliary loads (HHV): 8700 Btu/net kWh.

(h) Net Heat Rate (HHV) curve at various part load outputs at standard conditions.

(i) Minimum Gross output at the generator terminals: 1920 kW.

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		

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

1. Total Process Input Rate (lbs/hr): ______________________

2. Product Weight (lbs/hr): ______________________

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary) Total for two 10MW diesels

See attached Fairbanks Morse guarantees.

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/yr	T/yr	
NO_x	470	2100	NA	NA	470	2100	
CO	120	520	NA	NA	120	520	
HC	60	260	NA	NA	60	260	
SO_2	100	440	NA	NA	100	440	
TSP	20	90	20% opacity	NA	20	90	

[1]See Section V, Item 2.

[2]Reference 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)

[3]Calculated from operating rate and applicable standard.

[4]Emission, 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)

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
No.2 Fuel Oil	1400 gal	1400 gal	200
			total for two diesels

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

Fuel Analysis:

Percent Sulfur: 0.5 Percent Ash: 0.0

Density: 7.2 lbs/gal Typical Percent Nitrogen: 0.1

Heat content: (HHV) 19,500 BTU/lb 140,000 BTU/gal

Other Fuel Contaminants (which may cause air pollution):

See attachment labeled "Table 13" for emission of air toxics.

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

Annual Average ______ Maximum ______

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

None

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

Stack Height: 100 ft. Stack Diameter: 4 ft.

Gas Flow Rate: 73,000 ACFM 32,000 DSCFM Gas Exit Temperature: 600 °F.

Water Vapor Content: 6 % Velocity: 100 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (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 Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ 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 device: [ ] 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 1/2" 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 1/2" 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 (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" 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 [X] No

Contaminant	Rate or Concentration

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

[ ] Yes [X] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration
NO_x	8.0 gm/hp-hr

D. Describe the existing control and treatment technology (if any).

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

*Explain method of determining

5. Useful Life: 6. Operating Costs:

7. Energy: 8. Maintenance Cost:

9. Emissions:

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 attachedments labeled "BACT Analysis" and "Table 2".

1.

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:

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:

[1]Explain method of determining efficiency.
[2]Energy 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 Costs:

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:

1. Control Device: Timing retardation with NO_x emission of 8 gm/hp-hr

2. Efficiency:[1] 40 Percent

3. Capital Cost:

4. Useful Life: 20 Year

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer: Fairbanks Morse

9. Other locations where employed on similar processes:

a. (1) Company: Sebring Municipal Utility

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration
NO_x	10 gm/hp-hr

(8) Process Rate:[1]

b. (1) Company: PW Ventures

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration
NO_x	12 gm/hp-hr

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant 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

A. Company Monitored Data

1. ____________ no. sites ____________ TSP ____________ ( ) SO^2* ____________ 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. 5 Year(s) of data from 1 / 1 / 81 (month day year) to 12 / 31 / 85 (month day year)

2. Surface data obtained from (location) Miami

3. Upper air (mixing height) data obtained from (location) Miami

4. Stability wind rose (STAR) data obtained from (location) ______

C. Computer Models Used

1. PTPLU no Modified? If yes, attach description.

2. ISCST no 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	2.5 grams/sec	Total for two 10-MW diesel
SO^2	12.6 grams/sec	

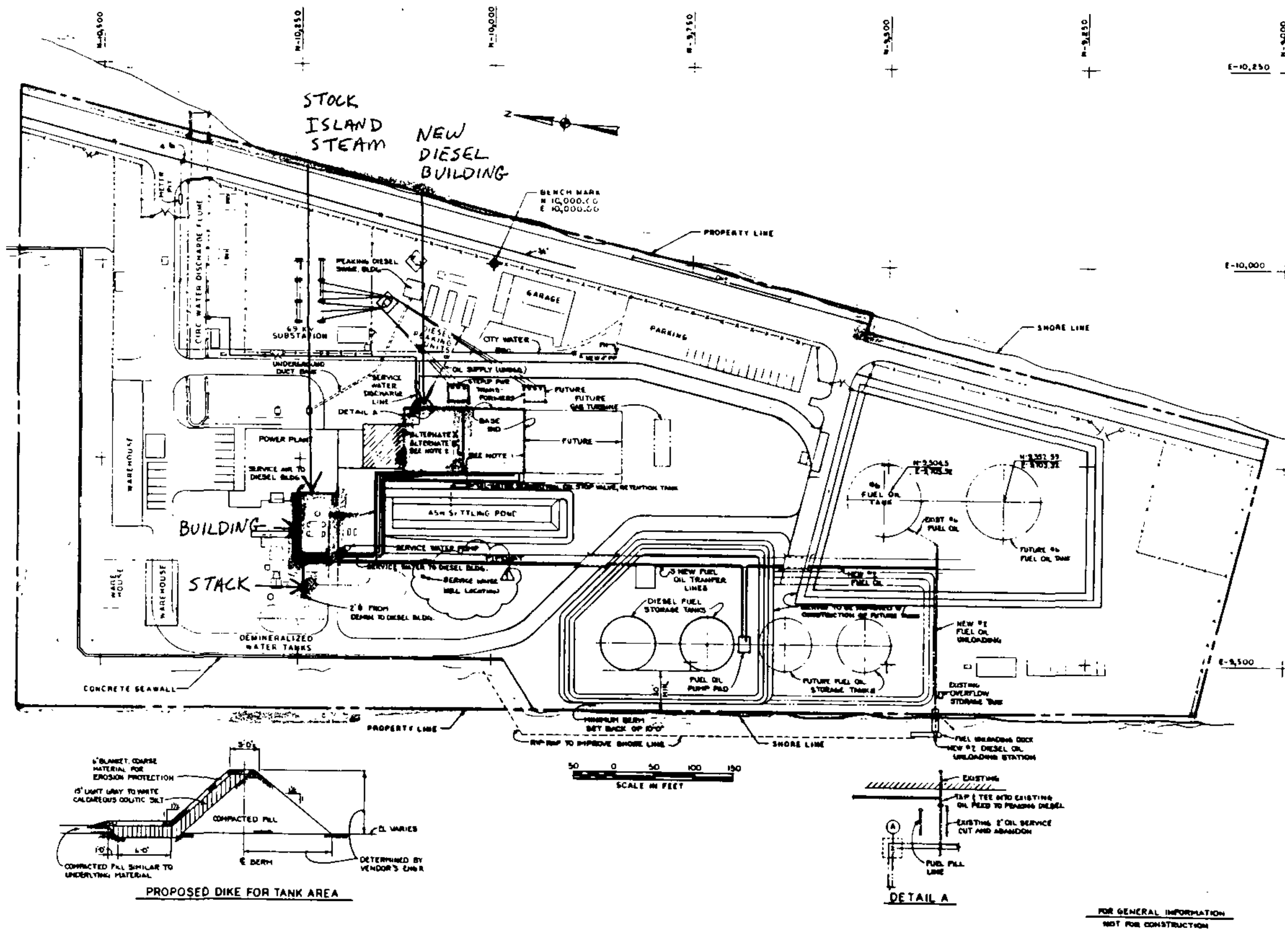
E. Emission Data Used in Modeling

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.



NOTES

1. ------ EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING, AND DIESEL DAY TANKS ON BASE BID
2. EXTENT OF AREA AVAILABLE FOR DIESEL PLANT BUILDING AND DIESEL DAY TANK FOR ALTERNATE AND ALTERNATE B
3. FOR INFORMATION ONLY, CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES.
4. FURNISH AND INSTALL UNDERGROUND DUCT BANKS BETWEEN DIESEL PLANT AND PEAKING DIESEL 15 KV SWITCHGEAR BUILDING, AND ANY OTHER LOCATIONS AS REQUIRED.

REVISIONS

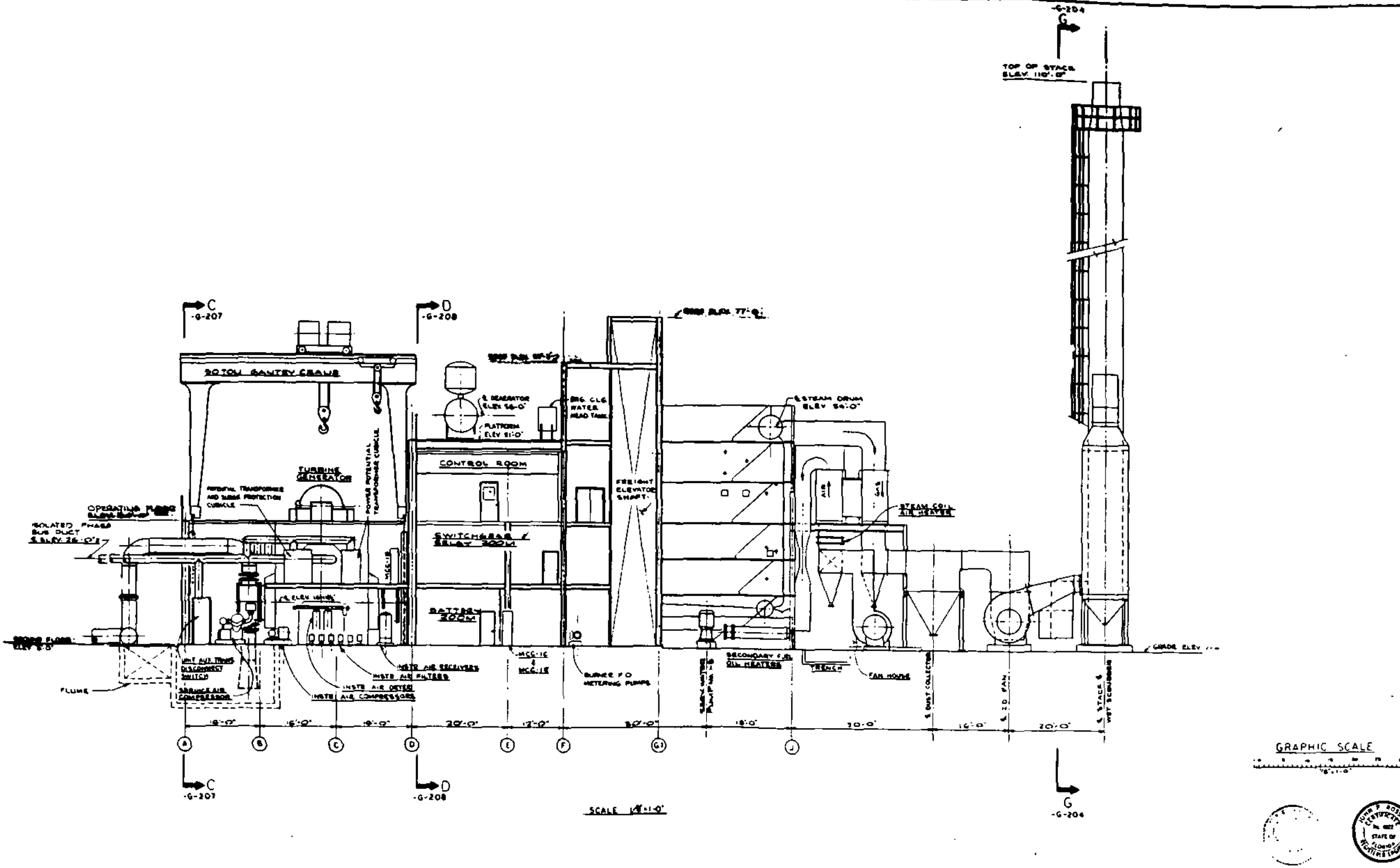
R. W. BECK AND ASSOCIATES

UTILITY BOARD OF THE CITY OF KEY WEST

STOCK ISLAND DIESEL GENERATING PLANT

PROPOSED SITE PLAN AND UNDERGROUND UTILITIES

2875—C—104.1



NOT FOR CONSTRUCTION

FOR GENERAL INFORMATION ONLY

REV	DATE	BY	CHK	APPD	DESCRIPTION
1					ISSUED FOR GENERAL & MECHANICAL CONSTRUCTION BID
0					ISSUED FOR G.C. CONTRACT

DRAWING REVISION RECORD

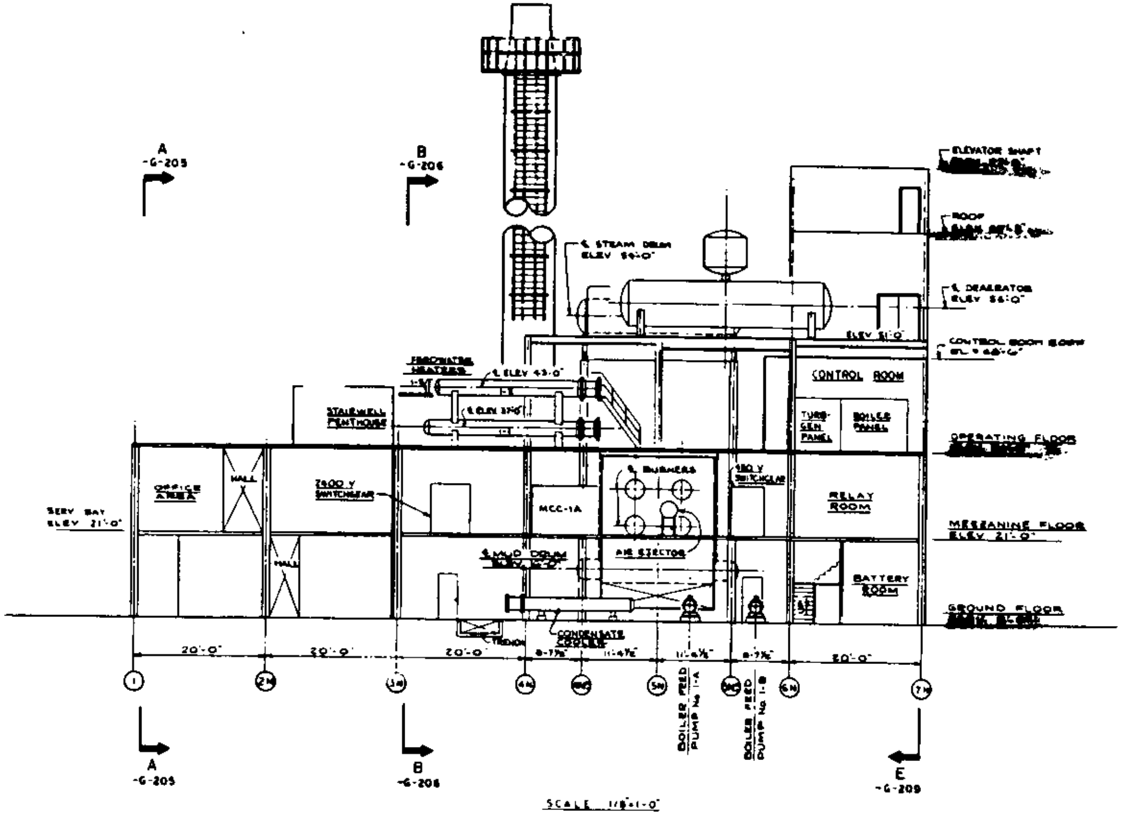
R. W. BECK and ASSOCIATES

UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA

STOCK ISLAND STEAM POWER PLANT
UNIT NO. 1

GENERAL ARRANGEMENT
SECTIONAL ELEVATION E-E

1155-G-209.1



GRAPHIC SCALE

1/8"=1'-0"

NOT FOR CONSTRUCTION

FOR GENERAL INFORMATION ONLY

REV	DATE	BY	CHK	APPD	DESCRIPTION
1	[illegible]	[illegible]	[illegible]	[illegible]	ISSUED FOR GENERAL & MECHANICAL CONSTRUCTION BID
0	[illegible]	[illegible]	[illegible]	[illegible]	ISSUED FOR G.C. CONTRACT

DRAWING REVISION RECORD

R. W. BECK and ASSOCIATES

UTILITY BOARD OF THE CITY OF KEY WEST
KEY WEST, FLORIDA

STOCK ISLAND STEAM POWER PLANT
UNIT No. 1

GENERAL ARRANGEMENT
SECTIONAL ELEVATION D-D

1155-G-208.1

ISCST (DATED 88207)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JUNE 88.
SOURCE: UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC.

IBM-PC VERSION (1.62)

SERIAL NUMBER 5503 SOLD TO R. W. BECK & ASSOC.
RUN BEGAN ON 08-17-88 AT 15:45:40

DER
Key West E-W
Downwash Scenario
1984
Stock Island Only

*** DER Key West E-W Downwash Scenario for 1984 ***

```
CALCULATE (CONCENTRATION=1,DEPOSITION=2)                              ISW(1) =   1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)               ISW(2) =   2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                      ISW(3) =   1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                              ISW(4) =   0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                         ISW(5) =   0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                      ISW(6) =   1

COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
WITH THE FOLLOWING TIME PERIODS:
  HOURLY (YES=1,NO=0)                                                 ISW(7) =   1
  2-HOUR (YES=1,NO=0)                                                 ISW(8) =   0
  3-HOUR (YES=1,NO=0)                                                 ISW(9) =   1
  4-HOUR (YES=1,NO=0)                                                ISW(10) =   0
  6-HOUR (YES=1,NO=0)                                                ISW(11) =   0
  8-HOUR (YES=1,NO=0)                                                ISW(12) =   0
  12-HOUR (YES=1,NO=0)                                               ISW(13) =   0
  24-HOUR (YES=1,NO=0)                                               ISW(14) =   1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                  ISW(15) =   0

PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
SPECIFIED BY ISW(7) THROUGH ISW(14):
  DAILY TABLES (YES=1,NO=0)                                          ISW(16) =   0
  HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                       ISW(17) =   1
  MAXIMUM 50 TABLES (YES=1,NO=0)                                     ISW(18) =   1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)            ISW(19) =   1
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)    ISW(20) =   0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)            ISW(21) =   1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)     ISW(22) =   1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                    ISW(23) =   0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)                ISW(24) =   1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)          ISW(25) =   2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)                ISW(26) =   1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)              ISW(27) =   1
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                              ISW(28) =   2
TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                     ISW(29) =   1
DEBUG OPTION CHOSEN (YES=1,NO=2)                                     ISW(30) =   2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                  ISW(31) =   0

NUMBER OF INPUT SOURCES                                               NSOURC =   1
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                              NGROUP =   1
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                  IPERD =   0
NUMBER OF X (RANGE) GRID VALUES                                       NXPNTS =   5
NUMBER OF Y (THETA) GRID VALUES                                       NYPNTS =   2
NUMBER OF DISCRETE RECEPTORS                                          NXWYPT =   0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR                              TK =.10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                      ZR =    7.00  METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                              IMET =   9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION                   DECAY = .000000E+00
SURFACE STATION NO.                                                      ISS = 12839
YEAR OF SURFACE DATA                                                     ISY = 84
UPPER AIR STATION NO.                                                    IUS = 12844
YEAR OF UPPER AIR DATA                                                   IUY = 84
ALLOCATED DATA STORAGE                                                 LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                             MIMIT =  1067 WORDS
```

*** METEOROLOGICAL DAYS TO BE PROCESSED ***
(IF=1)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

*** NUMBER OF SOURCE NUMBERS REQUIRED TO DEFINE SOURCE GROUPS ***
(NSOGRP)

1,

*** SOURCE NUMBERS DEFINING SOURCE GROUPS ***
(IDSOR)

1,

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** DER Key West E-W Downwash Scenario for 1984 ***

*** SOURCE DATA ***

SOURCE NUMBER	TYPE	WAKE	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (GRAMS/SEC) TYPE=2 (GRAMS/SEC) *PER METER**2	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	HEIGHT (METERS)	TEMP. TYPE=0 (DEG.K); VERT.DIM TYPE=1 (METERS)	EXIT VEL. TYPE=0 (M/SEC); HORZ.DIM TYPE=1,2 (METERS)	DIAMETER TYPE=0 (METERS)	BLDG. HEIGHT TYPE=0 (METERS)	BLDG. LENGTH TYPE=0 (METERS)	BLDG. WIDTH TYPE=0 (METERS)
1	0	0	0	.15059E+03	.0	.0	.0	31.70	460.00	44.81	1.52	18.29 (60')	29.71	29.71 (97.45')

CALM HOURS (=1) FOR DAY 6 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 7 *	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 19 *	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 25 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CALM HOURS (=1) FOR DAY 26 *	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 29 *	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 37 *	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 45 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
* CALM HOURS (=1) FOR DAY 46 *	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 47 *	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 49 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 51 *	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
* CALM HOURS (=1) FOR DAY 52 *	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 55 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CALM HOURS (=1) FOR DAY 56 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
* CALM HOURS (=1) FOR DAY 57 *	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 62 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
CALM HOURS (=1) FOR DAY 63 *	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 64 *	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 69 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 71 *	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 77 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 78 *	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 82 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 84 *	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 85 *	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 87 *	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 106 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 109 *	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 126 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 135 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 136 *	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 155 *	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 162 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 170 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 171 *	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 172 *	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 173 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 184 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 186 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 187 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 189 *	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 190 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
* CALM HOURS (=1) FOR DAY 192 *	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 193 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 194 *	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* CALM HOURS (=1) FOR DAY 197 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 198 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 199 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 203 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 204 *	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 205 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 218 *	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 220 *	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 221 *	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 223 *	0	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 225 *	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 230 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 231 *	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
* CALM HOURS (=1) FOR DAY 232 *	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 235 *	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 237 *	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 239 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 240 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 243 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
* CALM HOURS (=1) FOR DAY 244 *	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 245 *	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 247 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 248 *	1	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 249 *	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
* CALM HOURS (=1) FOR DAY 250 *	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 255 *	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 260 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
* CALM HOURS (=1) FOR DAY 273 *	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 274 *	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1
* CALM HOURS (=1) FOR DAY 275 *	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 288 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 289 *	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 290 *	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 308 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
* CALM HOURS (=1) FOR DAY 309 *	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
* CALM HOURS (=1) FOR DAY 316 *	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 322 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 324 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 325 *	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 333 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 334 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 335 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 336 *	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 337 *	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 338 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 341 *	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 347 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 355 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 356 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 357 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 365 *	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ISCST (DATED 88207)
AN AIR QUALITY DISPERSION MODEL IN
SECTION 1. GUIDELINE MODELS
IN UNAMAP (VERSION 6) JUNE 88.
SOURCE: UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC.

IBM-PC VERSION (1.62)

SERIAL NUMBER 5503 SOLD TO R. W. BECK & ASSOC.
RUN BEGAN ON 09-13-88 AT 07:28:56

*** DER Key West 360 deg Downwash Scenario for 1981 b70 ***

CALCULATE (CONCENTRATION=1,DEPOSITION=2)	ISW(1) = 1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)	ISW(2) = 2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)	ISW(3) = 1
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)	ISW(4) = 0
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)	ISW(5) = 0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)	ISW(6) = 1
COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)	
WITH THE FOLLOWING TIME PERIODS:	
HOURLY (YES=1,NO=0)	ISW(7) = 1
2-HOUR (YES=1,NO=0)	ISW(8) = 0
3-HOUR (YES=1,NO=0)	ISW(9) = 1
4-HOUR (YES=1,NO=0)	ISW(10) = 0
6-HOUR (YES=1,NO=0)	ISW(11) = 0
8-HOUR (YES=1,NO=0)	ISW(12) = 0
12-HOUR (YES=1,NO=0)	ISW(13) = 0
24-HOUR (YES=1,NO=0)	ISW(14) = 1
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)	ISW(15) = 0
PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE	
SPECIFIED BY ISW(7) THROUGH ISW(14):	
DAILY TABLES (YES=1,NO=0)	ISW(16) = 0
HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)	ISW(17) = 1
MAXIMUM 50 TABLES (YES=1,NO=0)	ISW(18) = 1
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)	ISW(19) = 1
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)	ISW(20) = 0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(21) = 1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)	ISW(22) = 1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)	ISW(23) = 0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)	ISW(24) = 1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)	ISW(25) = 2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)	ISW(26) = 1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)	ISW(27) = 1
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)	ISW(28) = 1
TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)	ISW(29) = 1
DEBUG OPTION CHOSEN (YES=1,NO=2)	ISW(30) = 2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)	ISW(31) = 0
NUMBER OF INPUT SOURCES	NSOURC = 2
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)	NGROUP = 2
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)	IPERD = 0
NUMBER OF X (RANGE) GRID VALUES	NXPNTS = 9
NUMBER OF Y (THETA) GRID VALUES	NYPNTS = 36
NUMBER OF DISCRETE RECEPTORS	NXWYPT = 0
SOURCE EMISSION RATE UNITS CONVERSION FACTOR	TK =.10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED	ZR = 7.00 METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA	IMET = 9
DECAY COEFFICIENT FOR PHYSICAL OR CHEMICAL DEPLETION	DECAY = .000000E+00
SURFACE STATION NO.	ISS = 12839
YEAR OF SURFACE DATA	ISY = 81
UPPER AIR STATION NO.	IUS = 12844
YEAR OF UPPER AIR DATA	IUY = 81
ALLOCATED DATA STORAGE	LIMIT = 43500 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN	MIMIT = 12193 WORDS

*** DER Key West 360 deg Downwash Scenario for 1981 b70 ***

*** METEOROLOGICAL DAYS TO BE PROCESSED ***
(IF=1)

```
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 0
```

*** NUMBER OF SOURCE NUMBERS REQUIRED TO DEFINE SOURCE GROUPS ***
(NSOGRP)

1, 1,

*** SOURCE NUMBERS DEFINING SOURCE GROUPS ***
(IDSOR)

1, 2,

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** WIND PROFILE EXPONENTS ***

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
B	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01	.70000E-01
C	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00	.10000E+00
D	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00	.15000E+00
E	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00	.35000E+00
F	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00	.55000E+00

*** VERTICAL POTENTIAL TEMPERATURE GRADIENTS ***
(DEGREES KELVIN PER METER)

STABILITY CATEGORY	WIND SPEED CATEGORY 1	2	3	4	5	6
A	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
B	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
C	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
D	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00	.00000E+00
E	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01	.20000E-01
F	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01	.35000E-01

*** RANGES OF POLAR GRID SYSTEM ***
(METERS)

100.0, 150.0, 200.0, 250.0, 300.0, 350.0, 400.0, 450.0, 500.0,

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***

(DEGREES)

10.0,	20.0,	30.0,	40.0,	50.0,	60.0,	70.0,	80.0,	90.0,	100.0,
110.0,	120.0,	130.0,	140.0,	150.0,	160.0,	170.0,	180.0,	190.0,	200.0,
210.0,	220.0,	230.0,	240.0,	250.0,	260.0,	270.0,	280.0,	290.0,	300.0,
310.0,	320.0,	330.0,	340.0,	350.0,	360.0,				

*** DER Key West 360 deg Downwash Scenario for 1981 b70 ***

*** SOURCE DATA ***

SOURCE NUMBER	T Y P E	W A K E	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (GRAMS/SEC) TYPE=2 (GRAMS/SEC) *PER METER**2	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	HEIGHT (METERS)	TEMP. TYPE=0 (DEG.K); VERT.DIM TYPE=1 (METERS)	EXIT VEL. TYPE=0 (M/SEC); HORZ.DIM TYPE=1,2 (METERS)	DIAMETER TYPE=0 (METERS)	BLDG. HEIGHT TYPE=0 (METERS)	BLDG. LENGTH TYPE=0 (METERS)	BLDG. WIDTH TYPE=0 (METERS)
1	0	0	0	.12600E+02	.0	.0	.0	30.48	589.00	30.00	1.20	-21.34	29.71	29.71
2	0	0	0	.15059E+03	.0	.0	.0	31.70	460.00	44.81	1.52	-21.34	29.71	29.71

*** DER Key West 360 deg Downwash Scenario for 1981 b70 ***

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE 1

IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE
1	21.3,	82.9,	0	2	21.3,	87.2,	0	3	21.3,	88.4,	0	4	21.3,	87.2,	0	5	21.3,	83.2,	0	6	21.3,	76.8,	0
7	21.3,	68.0,	0	8	21.3,	57.3,	0	9	21.3,	55.2,	0	10	21.3,	50.9,	0	11	21.3,	45.1,	0	12	21.3,	40.2,	0
13	21.3,	40.0,	0	14	21.3,	54.0,	0	15	21.3,	60.0,	0	16	21.3,	64.6,	0	17	21.3,	67.4,	0	18	21.3,	76.5,	0
19	21.3,	82.9,	0	20	21.3,	87.2,	0	21	21.3,	88.4,	0	22	21.3,	87.2,	0	23	21.3,	83.2,	0	24	21.3,	76.8,	0
25	21.3,	68.0,	0	26	21.3,	57.3,	0	27	21.3,	55.2,	0	28	21.3,	50.9,	0	29	21.3,	45.1,	0	30	21.3,	40.2,	0
31	21.3,	40.0,	0	32	21.3,	54.0,	0	33	21.3,	60.0,	0	34	21.3,	64.6,	0	35	21.3,	67.4,	0	36	21.3,	76.5,	0

SOURCE 2

IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE	IFV	BH	BW	IWAKE
1	21.3,	82.9,	0	2	21.3,	87.2,	0	3	21.3,	88.4,	0	4	21.3,	87.2,	0	5	21.3,	83.2,	0	6	21.3,	76.8,	0
7	21.3,	68.0,	0	8	21.3,	57.3,	0	9	21.3,	55.2,	0	10	21.3,	50.9,	0	11	21.3,	45.1,	0	12	21.3,	40.2,	0
13	21.3,	40.0,	0	14	21.3,	54.0,	0	15	21.3,	60.0,	0	16	21.3,	64.6,	0	17	21.3,	67.4,	0	18	21.3,	76.5,	0
19	21.3,	82.9,	0	20	21.3,	87.2,	0	21	21.3,	88.4,	0	22	21.3,	87.2,	0	23	21.3,	83.2,	0	24	21.3,	76.8,	0
25	21.3,	68.0,	0	26	21.3,	57.3,	0	27	21.3,	55.2,	0	28	21.3,	50.9,	0	29	21.3,	45.1,	0	30	21.3,	40.2,	0
31	21.3,	40.0,	0	32	21.3,	54.0,	0	33	21.3,	60.0,	0	34	21.3,	64.6,	0	35	21.3,	67.4,	0	36	21.3,	76.5,	0

```
* CALM HOURS (=1) FOR DAY   2 *  0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY   3 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
* CALM HOURS (=1) FOR DAY   7 *  0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  15 *  1 0 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1
* CALM HOURS (=1) FOR DAY  16 *  1 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  18 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
* CALM HOURS (=1) FOR DAY  19 *  0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 0 0 1 0 0 1 0
* CALM HOURS (=1) FOR DAY  20 *  1 1 1 0 0 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  23 *  0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
* CALM HOURS (=1) FOR DAY  26 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
* CALM HOURS (=1) FOR DAY  27 *  1 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
* CALM HOURS (=1) FOR DAY  28 *  1 1 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  29 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
* CALM HOURS (=1) FOR DAY  30 *  0 0 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1
* CALM HOURS (=1) FOR DAY  31 *  1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  38 *  0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  42 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
* CALM HOURS (=1) FOR DAY  50 *  0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  55 *  0 0 0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  56 *  0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 1 1
* CALM HOURS (=1) FOR DAY  57 *  0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  59 *  1 1 0 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  60 *  1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  61 *  1 0 1 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  69 *  0 0 1 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  72 *  0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  74 *  0 0 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  77 *  0 1 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY  91 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1
* CALM HOURS (=1) FOR DAY  92 *  1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 119 *  0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 130 *  0 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 135 *  0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 141 *  1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

CALM HOURS (=1) FOR DAY 158 *	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 159 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 160 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 161 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
CALM HOURS (=1) FOR DAY 162 *	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 172 *	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CALM HOURS (=1) FOR DAY 173 *	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
CALM HOURS (=1) FOR DAY 176 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 179 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 184 *	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 185 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
CALM HOURS (=1) FOR DAY 186 *	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 187 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 190 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 192 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 197 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
* CALM HOURS (=1) FOR DAY 199 *	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 200 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CALM HOURS (=1) FOR DAY 201 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 202 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
CALM HOURS (=1) FOR DAY 211 *	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 212 *	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 214 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
* CALM HOURS (=1) FOR DAY 215 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
CALM HOURS (=1) FOR DAY 216 *	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 219 *	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 233 *	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 234 *	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 235 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
* CALM HOURS (=1) FOR DAY 237 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
* CALM HOURS (=1) FOR DAY 238 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 239 *	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 242 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
* CALM HOURS (=1) FOR DAY 246 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 247 *	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 248 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 250 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
CALM HOURS (=1) FOR DAY 251 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 253 *	0	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 254 *	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
* CALM HOURS (=1) FOR DAY 255 *	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 256 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
CALM HOURS (=1) FOR DAY 257 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 259 *	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
CALM HOURS (=1) FOR DAY 260 *	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 261 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 263 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
* CALM HOURS (=1) FOR DAY 264 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 265 *	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
CALM HOURS (=1) FOR DAY 268 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 274 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
CALM HOURS (=1) FOR DAY 275 *	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 277 *	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 280 *	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 281 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
CALM HOURS (=1) FOR DAY 282 *	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 283 *	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
* CALM HOURS (=1) FOR DAY 284 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
CALM HOURS (=1) FOR DAY 300 *	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CALM HOURS (=1) FOR DAY 301 *	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

```
  CALM HOURS (=1) FOR DAY 302 *  0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  CALM HOURS (=1) FOR DAY 322 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0
* CALM HOURS (=1) FOR DAY 323 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
  CALM HOURS (=1) FOR DAY 328 *  0 0 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  CALM HOURS (=1) FOR DAY 332 *  0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 341 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1
  CALM HOURS (=1) FOR DAY 342 *  0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  CALM HOURS (=1) FOR DAY 347 *  0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  CALM HOURS (=1) FOR DAY 348 *  1 0 0 0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
* CALM HOURS (=1) FOR DAY 352 *  0 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
  CALM HOURS (=1) FOR DAY 359 *  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
  CALM HOURS (=1) FOR DAY 362 *  1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
```

Barnett Bank

Barnett Bank
3406 N. Roosevelt Blvd.

63-775/670

2490 № 109153

KEY WEST, FLORIDA "SOUTHERNMOST CITY IN THE CONTINENTAL UNITED STATES" July 13 19 88

PAY TO THE ORDER OF State of Florida, Department of Environmental Regulation** $ 2,000.00

PAY EXACT 2,000 AND 00 CTS DOLLARS

Remitter: City Electric/bc

CASHIER'S CHECK

Bette G. Garrell

⑈001091531⑈ ⑆067007758⑆ 40600012521⑈

Subject: PSD Application for Two 10-MW Diesel Generators at Key West, Florida

1031

Dear Mr. Fancy:

The Utility Board of the City of Key West, Florida ("CES") is planning to add two 10-MW diesel generators to their Stock Island plant. Our environmental engineer, R. W. Beck and Associates, has prepared the enclosed application for a construction permit and New Source Review. Original representative and engineer signature pages 1 and 2 from DER 17-1.202(1) are attached to the letter along with a $2000 check payable to DER for the processing fee. Four comb-bound copies of the application (including test, tables, figures and forms) and one comb-bound copy of the modeling printouts and experience information have been forwarded separately.

Mr. Michael D. Henderson of R. W. Beck and Associates had a pre-application meeting with your staff on June 30, 1988 to review the contents of the application on a preliminary basis and to identify additional issues requiring analysis to complete the application. Those items have been addressed in the application. It is understood that a fast-track process is available whereby any additional information required by DER could be requested via telephone. It is also understood that Mr. Barry Andrews is primarily responsible for BACT determination and will be leaving for a month's vacation on July 20, 1988. We have decided to not give our selected contract, Fairbanks Morse, notice to proceed until an indication of BACT is provided by DER. Should selective catalytic reduction ("SCR") be determined as BACT for emission of NOx, additional negotiations will be required with the contractor and CES may have to re-evaluate the decision to supply power with No. 2 oil-fired diesel generators.