

RESOLUTION NO. R-93- 340

RESOLUTION APPROVING ZONING PETITION NO. 92-14
SPECIAL EXCEPTION PETITION OF OKEELANTA CORPORATION

WHEREAS, the Board of County Commissioners, as the governing body, pursuant to the authority vested in Chapter 163 and Chapter 125, Florida Statutes, is authorized and empowered to consider petitions relating to zoning; and

WHEREAS, the notice and hearing requirements, as provided for in Chapter 402.5 of the Palm Beach County Zoning Code, have been satisfied; and

WHEREAS, Petition No. 92-14 was presented to the Board of County Commissioners of Palm Beach County, sitting as the Zoning Authority, at its Public Hearing conducted on July 30, 1992, and

WHEREAS, the Board of County Commissioners, sitting as the Zoning Authority, has considered the evidence and testimony presented by the applicant and other interested parties, and the recommendations of the various county review agencies and the recommendations of the Planning Commission; and

WHEREAS, this approval is subject to the Zoning Code, Section 402.9 (Mandatory Review of Development Approvals) and other provisions requiring that development commence in a timely manner; and

WHEREAS, the Board of County Commissioners, sitting as the Zoning Authority, made the following findings of fact:

1. This proposal is consistent with the requirements of the Comprehensive Plan and local land development regulations.

WHEREAS, Chapter 402.5 of the Zoning Code, requires that the action of the Board of County Commissioners, sitting as the Zoning Authority, be adopted by resolution.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF PALM BEACH COUNTY, FLORIDA, that Petition No. July 30, 1992, the petition of OKEELANTA CORPORATION, BY DANIEL D. ROSS, AGENT, for a SPECIAL EXCEPTION FOR PUBLIC AND PRIVATE UTILITY SERVICE (ELECTRICAL POWER FACILITY) on a parcel of land lying in the Northeast one-quarter of Section 13, Township 45 South, Range 36 East, Palm Beach County, Florida, more particularly described as follows: Commence at the Northeast corner of said Northeast one-quarter; thence S 00° 50' 58"E, along the East line of said Northeast one-quarter, a distance of 793.03 feet; thence S 89° 37' 17"W, a distance of 50.00 feet to the point of beginning; thence S 00° 50' 58"E, along a line parallel with and 50.00 feet West of the East line of said Northeast one-quarter, a distance of 1170.01 feet; thence S 89° 37' 17"W, a distance of 2508.51 feet to a point on a line parallel with and 80.00 feet East of the West line of said Northeast one-quarter; thence N 00° 55' 27"W, along said parallel line, a distance of 1078.02 feet; thence N 89° 37' 17"E, a distance of 402.64 feet; thence N 42° 03' 08"E, a distance of 124.64 feet; thence N 89° 37' 17"E, a distance of 2022.43 feet to the point of beginning., and being located approximately 2 1/4 miles S. of Bolles Canal and approximately 1.8 miles W. of SR 27, in the AP Zoning District, was approved on July 30, 1992, as advertised, subject to the following conditions:

A. AIR QUALITY

1. Petitioner shall:

a. Prior to initial start up, install all air pollution control devices and processes required by the Florida Department of Environmental Regulation (DERM), the United States Environmental Protection Agency (EPA), and as described in the environmental report (Exhibit A) to include, but not be limited to:

- (1) an electrostatic precipitator, designed for at least 98% removal of particulate matter or equivalent;
- (2) a thermal D-NOx system designed for at least 40% removal of oxides of nitrogen, or equivalent; and
- (3) an activated carbon injection system for control of mercury emissions, or equivalent.

b. Continuously monitor and record exhaust gas opacity, oxides of nitrogen, and carbon monoxide.

c. Test stack emissions according to DER and EPA standards at least once every six months for particular matter, oxides of nitrogen, carbon monoxide, sulfur dioxide, lead, mercury and volatile organic compounds for the first two years of operation. If the test results for the first two years of operations indicate the facility is operating in compliance with the terms of approval and of applicable permits and regulations, the test will thereafter occur as required by the respective DER and EPA permits, with the exception that stack emissions will be tested annually for mercury. In the event the results of the first two years of testing show non-compliance, then the frequency of testing shall continue to occur once every six months until the facility achieves a sustained two-year period of compliance.

d. Not exceed the total actual annual emissions from the existing boilers and those currently permitted for construction at this facility. Except for particulate matter and sulfur dioxide, the following figures represent the best available estimates for the actual current emissions. These emissions, in tons per year, by pollutant, are:

- | | |
|--|----------|
| (1) Particulate Matter: | 555.9 |
| (2) Oxides of Nitrogen: | 855.0 |
| (3) Carbon Monoxide: | 10,526.2 |
| (4) Volatile Organic Compounds: | 389.5 |
| (5) Mercury: | 0.0251 |
| (6) With regard to sulfur dioxide emissions, the following conditions shall apply: | |

(a) If used, coal shall be of the low sulfur variety, and shall not exceed 0.7% sulfur by weight.

(b) Fuel oil shall be limited to low sulfur **No. 2** distillate oil and shall not exceed **1%** sulphur by weight.

(c) Coal consumption shall not exceed 25% of the total heat input in any calendar quarter.

(Paragraphs (d) through (h) apply to total sulfur dioxide emissions for the combined facilities of petitions 92-13 and 92-14).

(d) Shall not exceed the current emissions of the proposed project (an average of **1000** tons of sulfur dioxide. If the life of the project exceeds thirty years, the total allowable lifetime emissions will be adjusted proportionately).

(e) For the case that the Palm Beach County government makes available **200,000** tons of biomass fuel per year to the cogeneration facilities in Petitions 92-13 and 92-14, under the same terms and conditions as those in the existing Okeelanta/Palm Beach Solid Waste Authority Wood-waste Agreement, the petitioner shall:

1) not exceed **1500** tons of sulfur dioxide for that year.

2) not exceed an average of **1300** tons of sulfur dioxide for each five year incremental period.

(f) For the case that the Palm Beach County government cannot make available the **200,000** tons of biomass fuel per year to the cogeneration facilities in Petitions 92-13 and 92-14, the petitioner shall:

(1) not exceed **1700** tons of sulfur dioxide for that year.

(2) not exceed an average of **1500** tons **of** sulfur dioxide for each ten year incremental period.

(g) The allowable average sulfur dioxide emissions for the five and ten year incremental periods described above shall be calculated on a weighted average for any period in which both cases occur (years in which biomass is made **available/years** in which biomass is not made avaiiable.)

(h) Sulfur dioxide emissions shall include all emissions from the proposed projects in Petitions **92-13** and **92-14** and the currently existing boilers at the Okeelanta and Osceola facilities if in operation during initial project operation.

- e. Employ all methods to control unconfined dust and particulate emissions, required by local, state and/or federal agencies.
 - f. Request in all applications to DER and EPA that the above conditions become part of the corresponding permits. (HEALTH)
2. During land clearing and site preparation, wetting operations or other soil treatment techniques appropriate for controlling unconfined particulates, including grass seeding and mulching of disturbed areas, shall be undertaken and implemented by the Petitioner to comply with state and federal air standards. (ZONING - Health)
 3. With the exception of clearing for access roads, survey lines, construction trailers, equipment staging areas, fencing, and specific building sites, construction shall commence within 90 days after completion of clearing and grading. Any cleared zones or areas not necessary to the operation of the site shall be planted in grass within 90 days after establishment of finished grade. (ZONING)
 4. The petitioner shall comply at all times with the requirements of all permits issued by all agencies having jurisdiction over the facility. (HEALTH - ERM)

B. BUILDING AND SITE DESIGN

1. Maximum total floor area shall be limited to 10% of the total lot area of the subject property. (BUILDING - Zoning)
2. Prior to site plan certification, the site plan shall be amended to indicate a maximum 6.6 acres building envelope on the site and the square footage to be contained therein. All construction and development of the principal structure and accessory facilities shall occur within this envelope. All accessory uses indicated on the site plan outside of the building envelope shall be subject to the requirements and regulations of Section 402.7 (E)2 (b) (Site Plan Review Committee Power; and Standards of Review). Uses and building locations within the envelope shall not be subject to this requirement. (ZONING)

C. ENVIRONMENTAL RESOURCES MANAGEMENT

1. Plans for all underground and above ground storage tanks must be approved by the Department of Environmental Resources Management prior to installation. The petitioner shall perform all necessary preventative measures to reduce the chances of contamination of the groundwater. Double walled tanks and piping with corrosion protection or their equivalent shall be a part of those measures. (BUILDING-ERM)
2. Secondary containment for stored Regulated Substances, including but not limited to fuels, oils, solvents, or other hazardous chemicals, is required. Department of Environmental Resources Management staff are willing to provide guidance on appropriate protective measures. (BUILDING-ERM)

3. All new excavated lakes shall possess a littoral shelf area. A littoral shelf shall be an area with a slope not greater than six (6) feet horizontal to one (1) foot vertical, ranging in depth from ordinary high water (OHW) or the controlled water level (CWL) to four feet below OHW or CWL. A minimum of 30% of the surface area of all lakes shall be planted with native aquatic vegetation on a minimum of three foot centers.
 - a. A littoral shelf planting plan and maintenance plan shall be submitted to the Department of Environmental Resources Management concurrent with Site Plan Review application and approved by ERM prior to Site Plan certification. This information shall also be provided on a mylar for the Zoning Division as part of the site plan application. (ERM)
 - b. Prior to the issuance of a Certificate of Occupancy and within three working days of the completion of littoral plantings ERM shall be notified. This planting shall not be credited as compensation required by wetland permits. (BUILDING-ERM)

D. EXOTIC SPECIES

1. Areas disturbed as a result of the construction of the cogeneration facility and transmission lines shall be continually maintained to be free of Brazilian Pepper, Australian Pine and Melaleuca. (ZONING)

E. ENGINEERING

1. The Developer shall provide discharge control and treatment for the stormwater runoff in accordance with all applicable agency requirements in effect at the time of the permit application. However, at a minimum, this development shall retain onsite the stormwater runoff generated by a three (3) year-one (1) hour storm with a total rainfall of 3 inches as required by the Permit Section, Land Development Division. The drainage system shall be maintained in an acceptable condition as approved by the County Engineer. In the event that the drainage system is not adequately maintained as determined by the County Engineer, this matter will be referred to the Code Enforcement Board for enforcement (COUNTY ENGINEER).
2. If required by the County Engineer or the South Florida Water Management District the Developer shall design the drainage system such that drainage from those areas which may contain hazardous or undesirable waste shall be separate from stormwater runoff from the remainder of the site (COUNTY ENGINEER).

F. HEALTH

1. Potable water supply for the proposed project is to be provided by a reverse osmosis non-transient non-community water supply system in accordance with Chapter 17-550 & 17-555, F.A.C. (HEALTH)
2. The industrial waste stream generated by this site shall be disposed of in accordance with all applicable Florida DER regulations. (HEALTH)

3. Cogeneration boiler fuels shall be limited to Biomass, as defined in Condition **K.9.** and fossil fuels. The use of fossil fuels shall be limited in accordance with conditions A.1.d. (6)(a), A.1.d. (6)(b) and A.1.d. (6) (c). The use of Biomass Wastes shall include provisions for the substantial exclusion of painted and chemically treated wood, household garbage, toxic or hazardous materials or wastes and special wastes. This specification must be reviewed and approved by the Palm Beach County Public Health Unit prior to site plan approval. (HEALTH)
4. All fly ash and bottom ash from the facility which is produced during any period in which fossil fuels are used, and thereafter for a reasonable time shall be segregated and managed as set forth in the ash management plan. (HEALTH)
5. Prior to site plan approval, a detailed ash management plan shall be submitted by the petitioner and approved by the Palm Beach County Public Health Unit. This plan must detail contingencies plans, testing and monitoring of the ash, ash handling and disposal methods, planned spreading locations and identification of environmental impacts and proposed measures for mitigating these impacts. (HEALTH)
6. Prior to site plan approval, a detailed fuel management plan shall be submitted and approved by the Palm Beach County Public Health Unit. This plan shall detail location, size, handling procedures, transportation, dust control and fire protection. (HEALTH)
7. Prior to site plan approval, the petitioner shall identify all liquid waste streams and provide a complete physical and chemical characterization of the waste streams which shall include, at a minimum, the following information:
 - a. A description of the source or process associated with the waste stream.
 - b. Volume and flow rates.
 - c. Physical parameters including temperature, pH, and total dissolved solids.
 - d. Expected concentrations of pollutants or contaminants, including but not limited to, Nitrogen, Phosphorous and other nutrients, mercury, lead and other trace metals, volatile or semivolatile organic compounds, etc.
 - e. A description and detail of any treatment system utilized.
 - f. A description of the disposal or reuse method and identification of all points of discharge. (HEALTH)
8. Prior to site plan approval, a detailed domestic wastewater management plan shall be submitted and approved by the Palm Beach County Public Health Unit. (HEALTH)

9. Prior to site plan approval, a detailed storm water management plan shall be submitted by the petitioner to the South Florida Water Management District (SFWMD) and Palm Beach County Public Health Unit for review and approval. Staff shall coordinate its review with the SFWMD. (HEALTH)
10. Prior to site plan approval, a detailed industrial wastewater management plan must be submitted to the Department of Environmental Regulation (DER) and the Palm Beach County Public Health Unit for review and approval. Staff shall coordinate its review with the DER. (HEALTH)
11. Prior to site plan approval, all applicable environmental permits or applications for permits must be obtained or submitted. (HEALTH)

G. LANDSCAPING

1. Prior to site plan certification, the petitioner shall submit a Landscape Betterment Plan for review and approval by the Zoning Division. The Landscape Betterment Plan shall demonstrate conformance to all Landscape Code requirements and conditions of approval. (ZONING)
2. As an alternative, the petitioner may landscape the site and provide off-site improvements in accordance with the Unified Land Development Code, upon adoption. (ZONING)

H. LIGHTING

1. All outdoor lighting used to illuminate the premises and identification signs shall be of low intensity, shielded and directed downward. (BUILDING - CODE ENF)

I. PARKING

1. Vehicle parking shall be limited to the parking areas designated on the approved site plan. No parking of vehicles shall be permitted in landscaped areas, right-of-way or interior drives. (CODE ENF)

J. TRANSMISSION LINES

1. All transmission lines required by this facility are to be constructed in accordance with the National Electric Safety Code. (BUILDING)
2. All transmission lines leaving the site and required by this facility shall not exceed 138 KV. (BUILDING)

K. USE LIMITATIONS

1. Use of the site shall be limited as follows:

Land Area	66.46 acres
Total Floor Area	288,250 square feet
Maximum Total Floor Area	10%
Electrical Production	74.9 mega watt maximum
Fuel Storage Yard	45 acre max. net land area

2. Prior to site plan certification, the site plan shall be amended to indicate the location of a truck/vehicle wash facility. This wash facility shall utilize a 100% water recycling system. (ZONING/BUILDING)
3. There shall be no repair or maintenance of vehicles on site. (CODE ENF)
4. No outside storage of disassembled vehicles, or parts thereof, shall be permitted on site. (CODE ENF)
5. The maximum height, from grade to highest point, for all fuel storage areas shall not exceed fifty (50) feet. (BUILDING)
6. Onsite storage shall be contained within the area designated on Exhibit 48 and shall be processed and stored in a manner which controls fugitive and dust particulate emissions. (CODE ENF)
7. All vehicles utilizing public rights-of-way to carry biomass waste (i.e. vegetative matter) to the site shall be equipped, at a minimum, with covering or screens over top of the open bed of the vehicle to prevent the loss of material during transportation to the facility. (CODE ENF)
8. The storage of fuel on site shall be limited to the areas designated on the certified site plan and shall be limited to the storage of bagasse and biomass waste only. (CODE ENFORCEMENT)
9. "Biomass Waste", as referred to herein, shall mean bagasse, vegetative and woody matter, including material resulting from landscaping, maintenance, land clearing operations, clean wood, cellulose material, tree and shrub trimmings, grass clippings, palm fronds, trees, tree stumps, wood from land development operations, clean wood debris from demolition operations; it shall not include trash, garbage or sludge (FAC 17-701), biohazardous waste (17-712 FAC), or biological waste (17-712 FAC).
10. The existing boiler facilities shall be abandoned within three (3) years of commercial start up of the cogeneration facility and no later than January 1, 1999. The existing boilers and new facilities shall not be operated at the same time. (MONITORING/CODE ENFORCEMENT)

L. WATER SUPPLY

1. Construction shall not commence on the project site until it has been demonstrated to the satisfaction of the South Florida Water Management District that an acceptable and sustainable supply of water during drought periods is available to serve the project over and above that necessary to serve already approved development. (BUILDING - SFWMD)
2. The petitioner shall utilize all drought-tolerant plants in landscaping on the subject property. (ZONING)

3. The petitioner shall use water-saving plumbing fixtures and other water conserving devices in restroom; and employee locker rooms, as specified in the Water Conservation Act, Section 553.14, Florida Statutes. (BUILDING)

M. COMPLIANCE

1. As provided in the Palm Beach County Zoning Code, Sections 400.2 and 402.6, failure to comply with any of these conditions of approval at any time may result in:
 - a. The denial or revocation of a building permit; the issuance of a stop work order; the denial of a Certificate of Occupancy on any building or structure; or the denial or revocation of any permit or approval for any developer-owner, commercial-owner, lessee, or user of the subject property; and/or
 - b. The revocation of the Special Exception and any zoning which was approved concurrently with the Special Exception as well as any previously granted certifications of concurrency or exemptions therefrom; and/or
 - c. A requirement of the development to conform with updated standards of development, applicable at the time of the finding of non-compliance, or the addition or modification of conditions reasonably related to the failure to comply with existing conditions. (MONITORING)
2. Appeals of any departmental-administrative actions hereunder may be taken to the Palm Beach County Board of Adjustment or as otherwise provided in the Palm Beach County Zoning Code. Appeals of any revocation of Special Exception, Rezoning, or other actions based on a Board of County Commission decision, shall be by petition for writ of certiorari to the Fifteenth Judicial Circuit. (MONITORING)

Commissioner Marcus moved for approval of the Resolution.

The motion was seconded by Commissioner Roberts and upon being put to a vote, the vote was as follows:

Mary McCarty, Chair	--	aye
Ken Foster	--	aye
Burt Aaronson	--	aye
Maude Ford Lee	--	aye
Karen T. Marcus	--	aye
Warren H. Newell	--	aye
Carol A. Roberts	--	aye

The Chair thereupon declared the resolution was duly passed and adopted this 16th day of March, 1993.

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

PALM BEACH COUNTY, FLORICA
BY ITS BOARD OF COUNTY
COMMISSIONERS

BY:


COUNTY ATTORNEY

BY:


DEPUTY CLERK

EXHIBIT **A**

**OKEELANTA AND OSCEOLA COGENERATION FACILITIES
AND THE ENVIRONMENT**

Prepared By
KBN Engineering and Applied Science, Inc.
and
Flo-Sun, Inc.

May 1992

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1.0 EXECUTIVE SUMMARY

Okeelanta Corporation (Okeelanta) and Osceola Farms Company (Osceola) have been growing sugar cane and operating sugar mills in western Palm Beach County for over 30 years. Both of these facilities have operated as cogeneration facilities for many years since they burn bagasse and supplemental fuels to generate the steam and electricity required by the sugar mill grinding and refining process.

Okeelanta and Osceola propose to replace the existing cogeneration facilities (i.e., boilers, steam turbine generation, and related equipment) at each site with state-of-the-art facilities which will use the latest power generation and environmental control technology. The new facilities will continue to supply the process steam requirements for the sugar mill and will also sell electric power to Florida Power & Light Company (FPL).

The federal government and the State of Florida have recognized the potential economic and environmental value of cogeneration and have enacted legislation to encourage the development of cogeneration facilities. In 1978, Congress enacted the Public Utilities Regulatory Policy Act (PURPA - part of the 1978 National Energy Act) which encourages the development of cogeneration by requiring electric utilities to interconnect and purchase power from cogeneration facilities. In 1980, the Florida legislature enacted the Florida Energy Efficiency and Conservation Act (FEECA) (Florida Statutes Ch. 366.80), which "declares that ss 366-80-366.85 and 403.519 are to be liberally construed in order to... [encourage] further development of cogeneration facilities; and [conserve] expensive resources, particularly petroleum fuels." The Okeelanta and Osceola projects will support these legislative goals by generating energy more efficiently than the existing facilities or a "stand-alone" facility. In addition, they will utilize renewable, biomass fuels rather than fossil fuels.

The new proposed cogeneration facilities will reduce total annual air emissions and water consumption while generating about 15 times more electric energy than the existing facilities. "This is a "win-win" situation where the environment wins and electric consumers win by applying technology improvements in power generating and environmental control equipment. The attached tables [Table 1 for Okeelanta (page 3) and Table 2 for Osceola (page 4)] contain a comparison of air emissions between the existing and proposed projects. These tables demonstrate that the proposed facilities will reduce every category of controlled air emissions.

The proposed facilities will use bagasse and wood waste to fuel the boilers and will thus help with the waste disposal problem in South Florida. The Okeelanta facility will utilize approximately 1,025,000 tons of waste materials per year (705,000 tons of bagasse and 320,000 tons of wood waste) and the Osceola facility approximately 635,000 tons (425,000 tons of bagasse and 210,000 tons of wood waste). The wood waste used by the facilities is approximately equal to the volume of wood waste generated by Palm Beach County every year.

The proposed facilities will use renewable fuels (bagasse and wood waste) and deliver to FPL the energy equivalent of approximately 1,375,000 barrels of oil, or 355,000 tons of coal per year. The total fuel displacement of the facilities is 2,050,000 barrels of oil, or 530,000 tons of coal; the remaining energy will be delivered to the sugar mill and refinery.

Finally, the proposed projects also offer significant economic benefits. There will be a construction payroll of between \$50 million and \$60 million over a period of more than 2 years. Also, the projects will create between 80 and 90 new, permanent positions to operate the new facilities and deliver the wood waste material. Additionally, the projects will pay approximately \$5 million a year in property taxes.

2.0 INTRODUCTION AND DESCRIPTION OF PROJECTS

Flo-Sun is primarily an agricultural corporation based in Palm Beach County, Florida. Flo-Sun, through various corporate subsidiaries, controls and manages approximately 180,000 acres of farm lands in the Everglades Agricultural Area and 3 sugar mills as well as other agricultural facilities. Flo-Sun employs approximately 2,500 people in Palm Beach County.

Flo-Sun is proposing to construct two new, state-of-the-art cogeneration projects to replace existing older cogeneration facilities at their Okeelanta and Osceola sugar mills. The new cogeneration projects will supply the steam needs of the sugar mills and additionally will deliver a substantial amount of electricity to FPL to supply customers in South Florida. (See Chapter 3 for details). The new cogeneration projects will occupy approximately 66 acres at Okeelanta and 50 acres at Osceola, adjacent to the sugar mill facilities. (The actual developed area will be 5 acres for buildings and 20 acres for the fuel yard at each site.) These sites are located in western Palm Beach County (Okeelanta is six miles south of South Bay and Osceola is five miles east of Pahokee) and are substantially buffered from urbanized areas by the surrounding agricultural land.

The projects will undergo an extensive and rigorous environmental permitting process which addresses air emissions; water consumption; waste water discharge; ash management and disposal; and site development and land use. Local, regional, state, and federal agencies will be involved. Appendix B tabulates all the permits which will have to be secured and the permitting agencies which will issue the permits.

The bagasse residue from the sugar grinding operation will provide approximately 2/3 of the fuel requirements of the new projects. The other 1/3 will be provided by wood waste material sources within a 75-mile radius.

The remainder of this report discusses the environmental benefits of the proposed new cogeneration projects.

3.0 PROJECTS ARE BETTER THAN EXISTING UNITS OR NEW FOSSIL UNITS

3.1 AIR QUALITY

The proposed facilities will minimize air emissions through the use of modern boiler technology, clean fuels, and modern air pollution control technology. Modern boiler technology for firing bagasse and wood fuels incorporates a traveling grate spreader stoker, proper air supply and distribution, and sufficient residence time and combustion temperature to maximize combustion efficiency and reduce emissions. The boiler design minimizes emissions of nitrogen oxides, carbon monoxide, volatile organic compounds, and other organic emissions. The new boilers will replace the existing boilers. Without these projects, the existing boilers would continue to operate into the foreseeable future.

Tables 1 and 2 and the attached graphs present a comparison of the current actual emissions from the Okeelanta sugar mill (including a recently permitted but not yet operational oil-fired boiler) and Osceola sugar mill versus the maximum emissions from the proposed cogeneration facilities. Also presented are maximum emissions from a comparable coal-fired facility employing best available control technology (BACT). It should be noted that this comparison is inherently biased against the new proposed cogeneration facilities, because these new facilities will generate more energy than either the existing sugar mill facilities or a "stand-alone, electric-only" generating facility. The tables demonstrate that emissions from the new proposed cogeneration compare favorably with these alternatives, notwithstanding this inherent disadvantage.

A modern, high-efficiency electrostatic precipitator (ESP) will be used at each new facility to reduce particulate matter (PM) emissions to levels well below the State of Florida emission standards and federal new source performance standards (NSPS). An emission level of 0.03 lb/MMBtu will be achieved at each site even though state and federal emission standards allow a limit of 0.20 lb/MMBtu for bagasse and 0.10 lb/MMBtu for wood firing. The emission rate and total annual PM emissions for both the new Okeelanta and Osceola cogeneration facilities will be lower than existing emissions by approximately 300 percent.

Sulfur dioxide (SO₂) emissions will be reduced significantly by the use of clean fuels (bagasse and wood), with low sulfur fuel oil as backup. The current Okeelanta facility burns approximately 3 million gallons of high sulfur (2.5 percent) fuel oil and is permitted to burn an additional 6 million gallons of No. 2 fuel oil. The expected SO₂ emissions at Okeelanta will be 3 to

10 times lower than either the existing facility or the typical new utility facility. The expected SO₂ emissions at Osceola will also be comparably lower.

The new boiler design and a catalytic reduction system will be utilized to reduce nitrogen oxides (NO_x) emissions. The new boilers will generate **less** NO_x than the existing boilers through better control of combustion air and temperatures; better distribution of fuel on the combustion surface; and better controls over furnace loads and transient conditions. Additionally, the catalytic reduction system will remove 40 to 50 percent of the NO_x that is produced. The end result is that NO_x emissions from the new Okeelanta and Osceola facilities are expected to be less than emissions from the existing facilities or the hypothetical utility facility.

Emissions of carbon monoxide (CO) and volatile organic compounds (VOC) will be significantly reduced **as** a result of the projects by the modern boiler technology and resulting high combustion efficiency at the new facilities. CO emissions will be reduced by approximately 600 percent. Due to the variability of bagasse and wood fuel, CO and VOC emissions will be higher than a comparable coal-fired facility; however, the levels are low and will result in a net improvement on air quality in Palm Beach County.

Uncontrolled mercury emissions from the proposed cogeneration facilities will be much less than emissions from a comparable coal-fired or resource recovery facility at Best Available Control Technology (**BACT**). Additionally, even though the **DER** has not yet promulgated generally applicable limits for mercury emissions and there is no specific regulatory requirement to add mercury control equipment for our facilities, the projects will use the "activated carbon injection" system at the new facilities to reduce mercury emissions to even lower levels. This is the preferred technology for mercury removal from boiler flue gas streams. This technology is theoretically capable of reducing mercury emissions by more than **50** percent. It should be noted, however, that this is still a new technology with a very limited historical data base. There are only a handful of installations around the world with this technology, all of them in facilities which emit much higher levels of mercury.

In summary, **as** shown in the attached tables and graphs, the proposed cogeneration facilities will emit **less** mercury than the existing facilities at Okeelanta or Osceola and about 100 times less than current permit levels for resource recovery facilities.

3.2 WATER USE

The Okeelanta sugar mill currently has a water use permit from the South Florida Water Management District for withdrawal of surface water from the Miami Canal. The maximum daily permitted volume is 14.4 million gallons per day (MGD), with an average withdrawal of 12.79 MGD for 6 months of each year. The annual allocation is 2,334 million gallons.

The Okeelanta sugar mill utilizes this water to supply the existing boilers and water scrubbers plus the sugar grinding and fabrication process. The proposed cogeneration plant will supply process steam to the sugar mill (which produces raw sugar) during the grinding season and to the sugar refinery (which produces refined sugar) year-round. The new facility will thus replace the existing boilers and water scrubbers which use approximately 7 MGD of water.

The proposed cogeneration plant will require a maximum daily use of approximately 2.4 MGD. Therefore, the net result will be a reduction in water consumption of approximately 4.6 MGD (i.e., 7 MGD of consumption is replaced with 2.4 MGD) during 6 months of the year. Even on a year-round basis, the water consumption from the proposed facility will be less than the current consumption. Additionally, the seasonal increase in water consumption will occur during the rainy (summer) season when Okeelanta is typically pumping excess water.

The Osceola sugar mill currently operates a large, onsite, closed-canal system that serves as a source of water as well as a disposal site for industrial wastewater. The Osceola sugar mill utilizes water from this closed canal to supply the existing boilers and water scrubbers, and the sugar grinding and fabrication process. As is the case in Okeelanta, the proposed cogeneration plant will supply steam to the sugar mill and replace the existing boilers and water scrubbers, which use approximately 4.6 MGD of water. The proposed plant will require a maximum daily use of approximately 1.45 MGD. Therefore, the net result will be a reduction in water consumption of approximately 3.15 MGD.

Finally, it should again be noted that the above water consumption comparisons are biased against the proposed facilities, which will produce 15 times more electric energy than the existing sugar mill facilities. The improvements in water consumption are even more dramatic if the figures are compared to facilities that would produce an equivalent amount of energy.

The proposed Okeelanta facility will generate approximately 15,000 tons per year (TPY) of ash. Approximately half of this volume will result from the combustion of bagasse (less than 1 percent ash) and the other half from the combustion of wood waste. About 85 percent of the volume will be fly ash and the remainder bottom ash.

The proposed Osceola facility will generate approximately 10,000 TPY of ash with the same component breakdown as Okeelanta. Generally speaking, the above volumes are much lower than the ash generated from similarly sized solid fuel fossil facilities. For example, coal normally contains 8 to 10 percent ash.

The ash generated by the existing facilities consists primarily of oxide and silicate salts (no toxics); therefore, it is currently returned to the soil without any special treatment or isolation. At Okeelanta, the fly ash is sluiced with water and pumped to adjacent sugar cane fields where it percolates into the soil. At Osceola, the fly ash is sluiced and pumped into an adjoining closed canal system, which recirculates service and cooling water to the sugar mill. The bottom ash at both sites is directly spread in the adjoining fields. Ash from wood-fired facilities is expected to have similar characteristics as ash from bagasse. In fact, facilities that utilize boilers that burn only vegetative agricultural wastes, bagasse, or clean, dry wood are exempted from the FDER rules that regulate the management and disposal of ash from solid waste combusters.

The new proposed facilities will use clean, organic, biomass fuels, and the ash generated by the facilities can be similarly returned to the soil without treatment or isolation.

The new facilities will capture the fly ash in an electrostatic precipitator. The ash will be settled and conditioned before transportation to the fields. The specific handling and disposal system will be designed to facilitate disposal in the fields.

3.5 ENERGY OUTPUT

The existing facilities at Okeelanta supply process steam and electric power to the sugar mill and refinery.

The proposed cogeneration facility will supply all the process steam requirements to the sugar mill and refinery and will generate approximately 15 times more electric energy than the existing facilities.

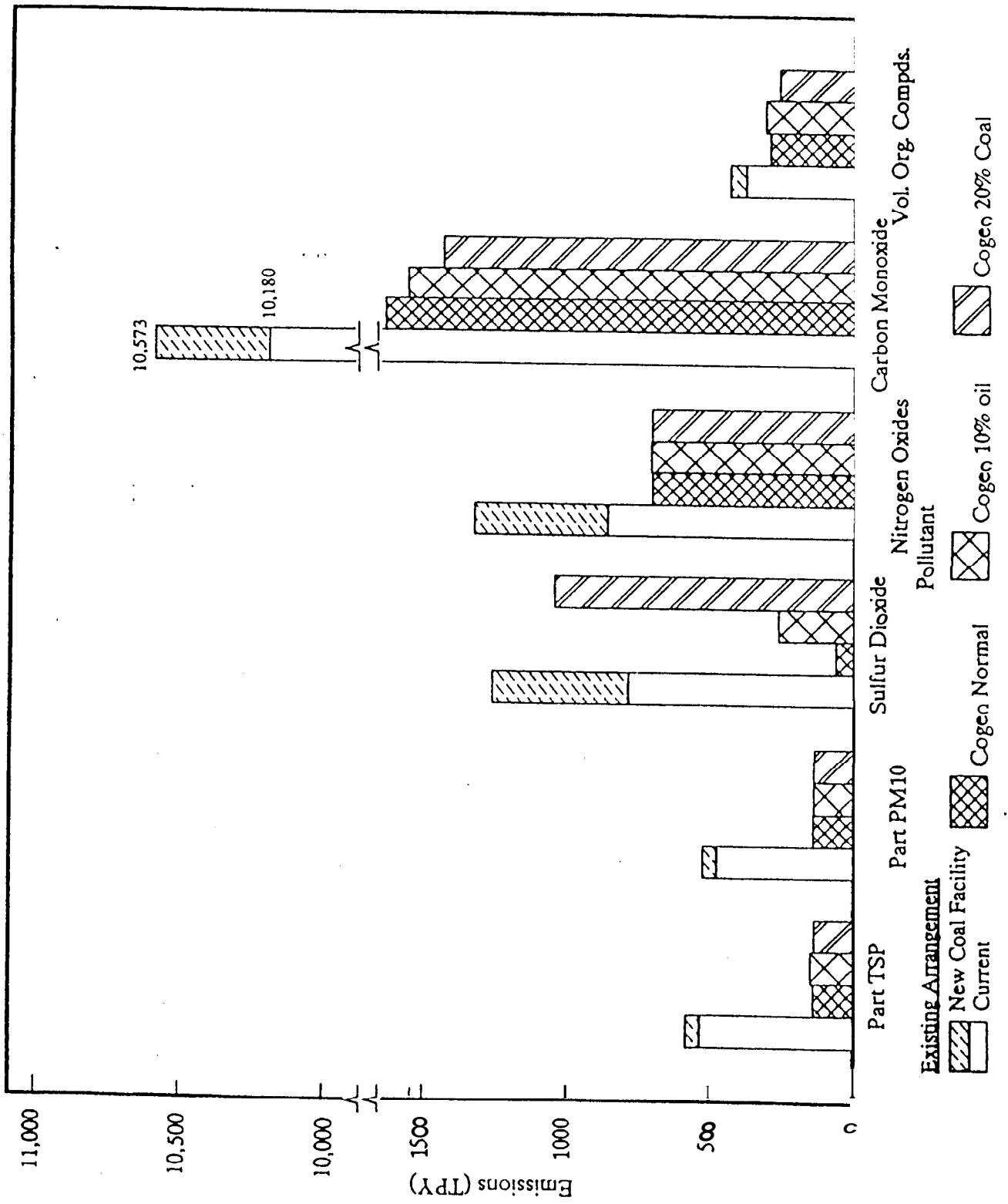
This increase in energy output is achieved primarily through technological advances in the boilers and steam turbine-generators. The proposed facility will operate at much higher steam temperature and pressures than the **existing** facility and will utilize very modern and efficient equipment and control systems.

The power generated by the new facilities **will** be delivered to FPL under the terms of two power sales agreements with FPL. **FPL** is counting on this power to serve projected power needs.

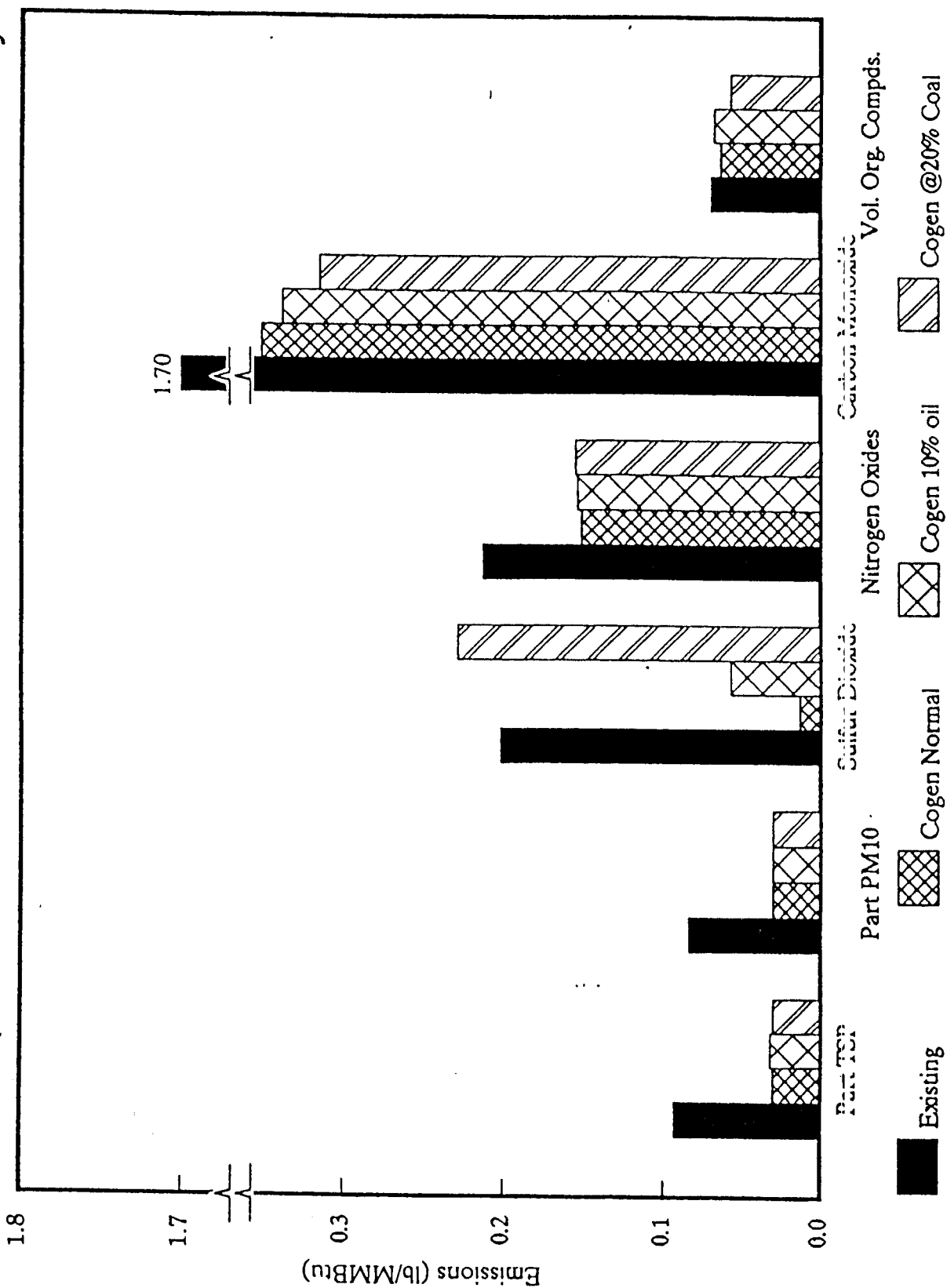
The table below compares the electric energy output of the new and existing facilities

<u>Existing</u>	<u>Okeelanta</u>	<u>Osceola</u>	<u>Total</u>
Gross Energy (kw-hr x 10 ⁶)	40	18	58
<i>New</i>			
Gross Energy	564	351	915
Net Energy (kw-hr x 10 ⁶)	535	320	855
Equivalent Residential Customers	45,000	27,000	72,000

Comparison of Emission Rates for Okeelanta Facility

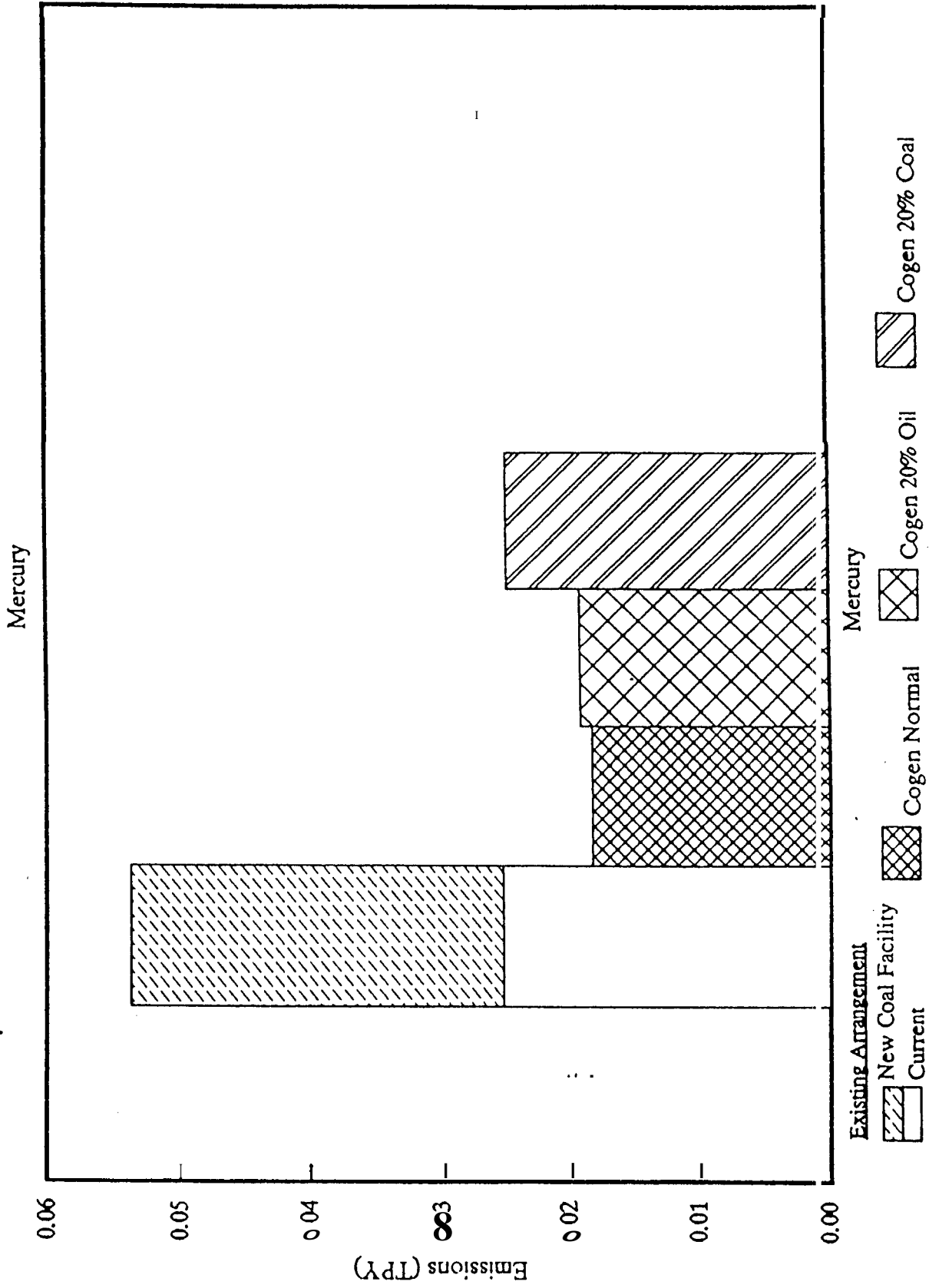


Comparison of Emission Rates for Okeelanta Facility



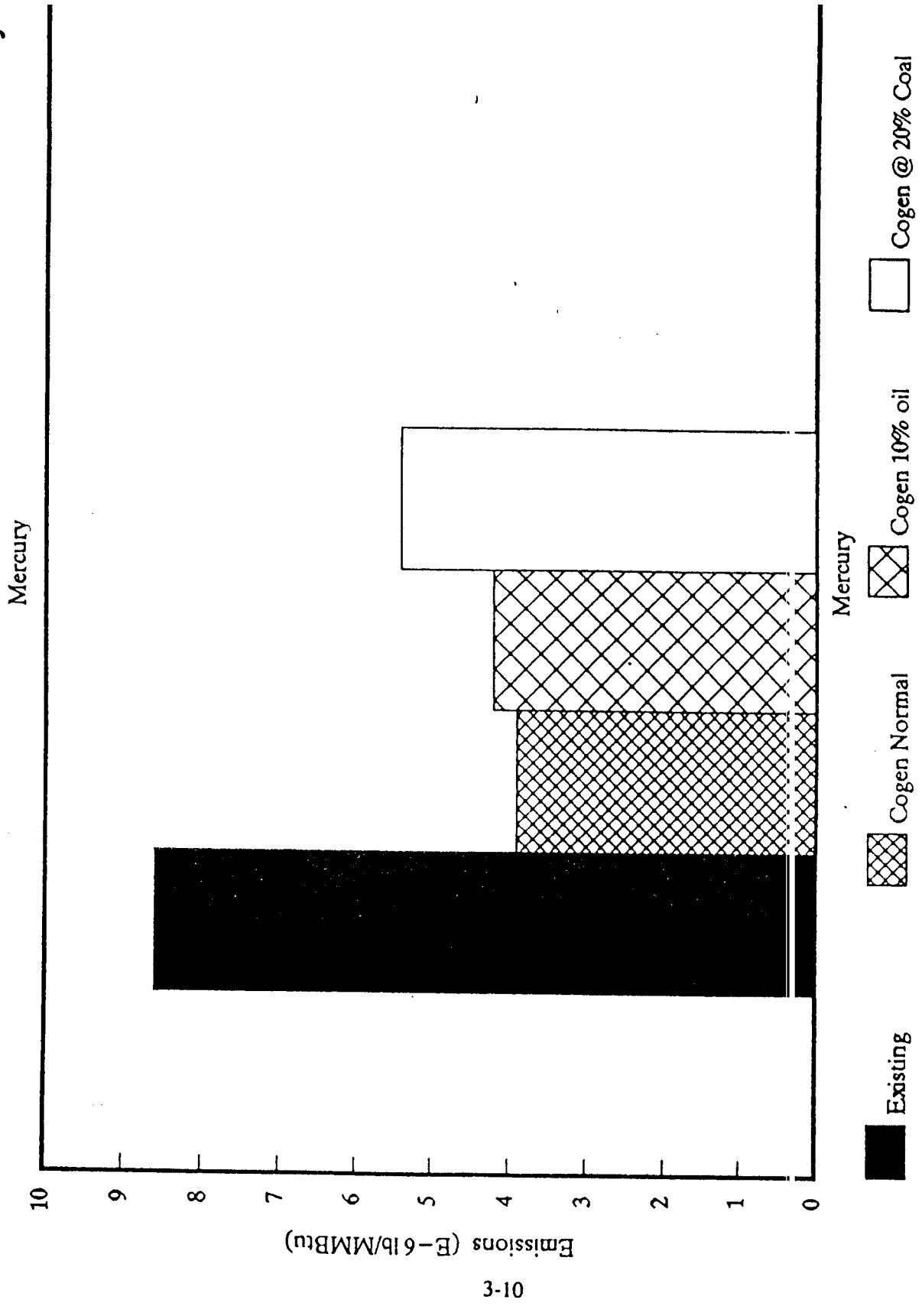
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Comparison of Emission Rates for Okeelanta Facility

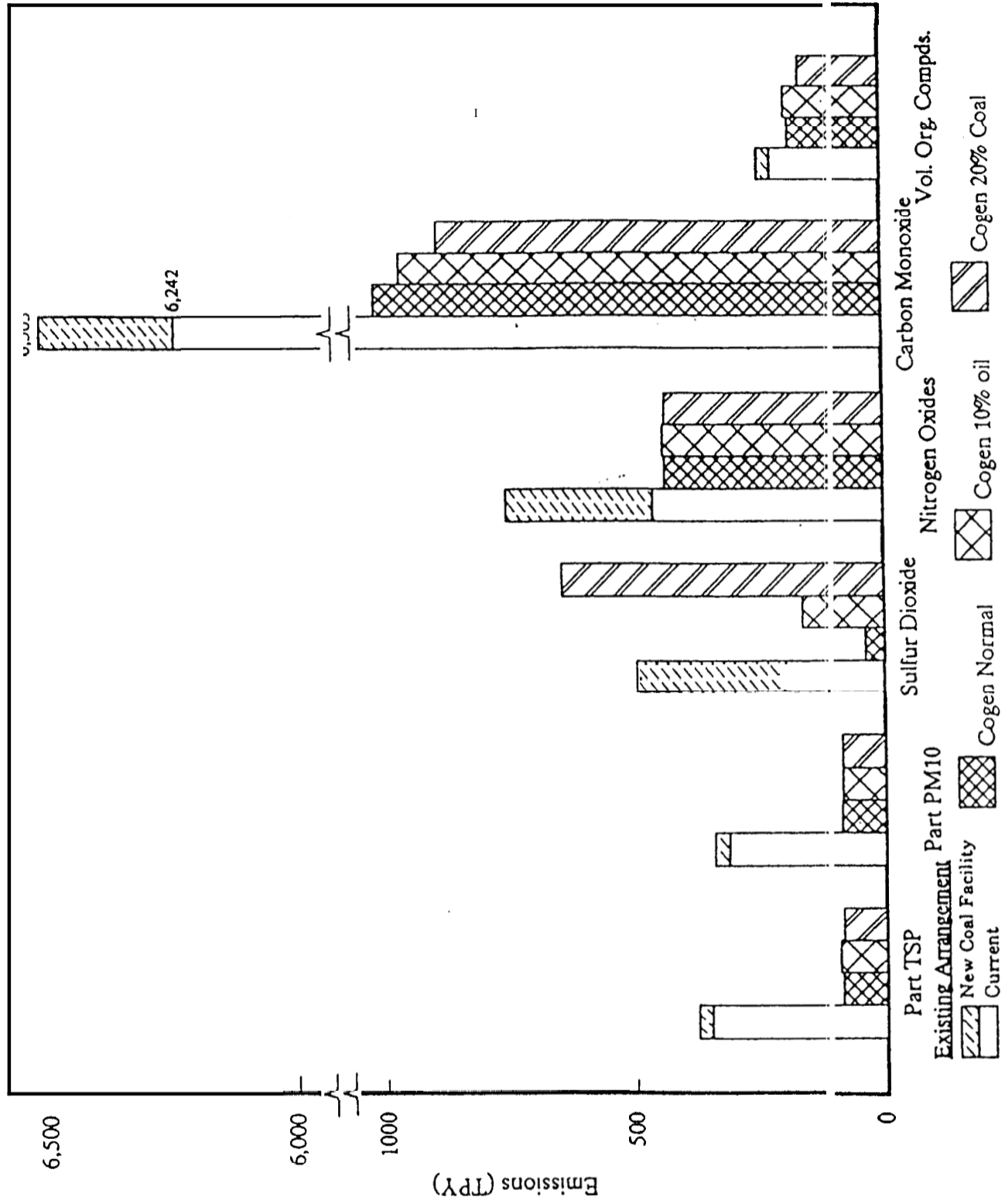


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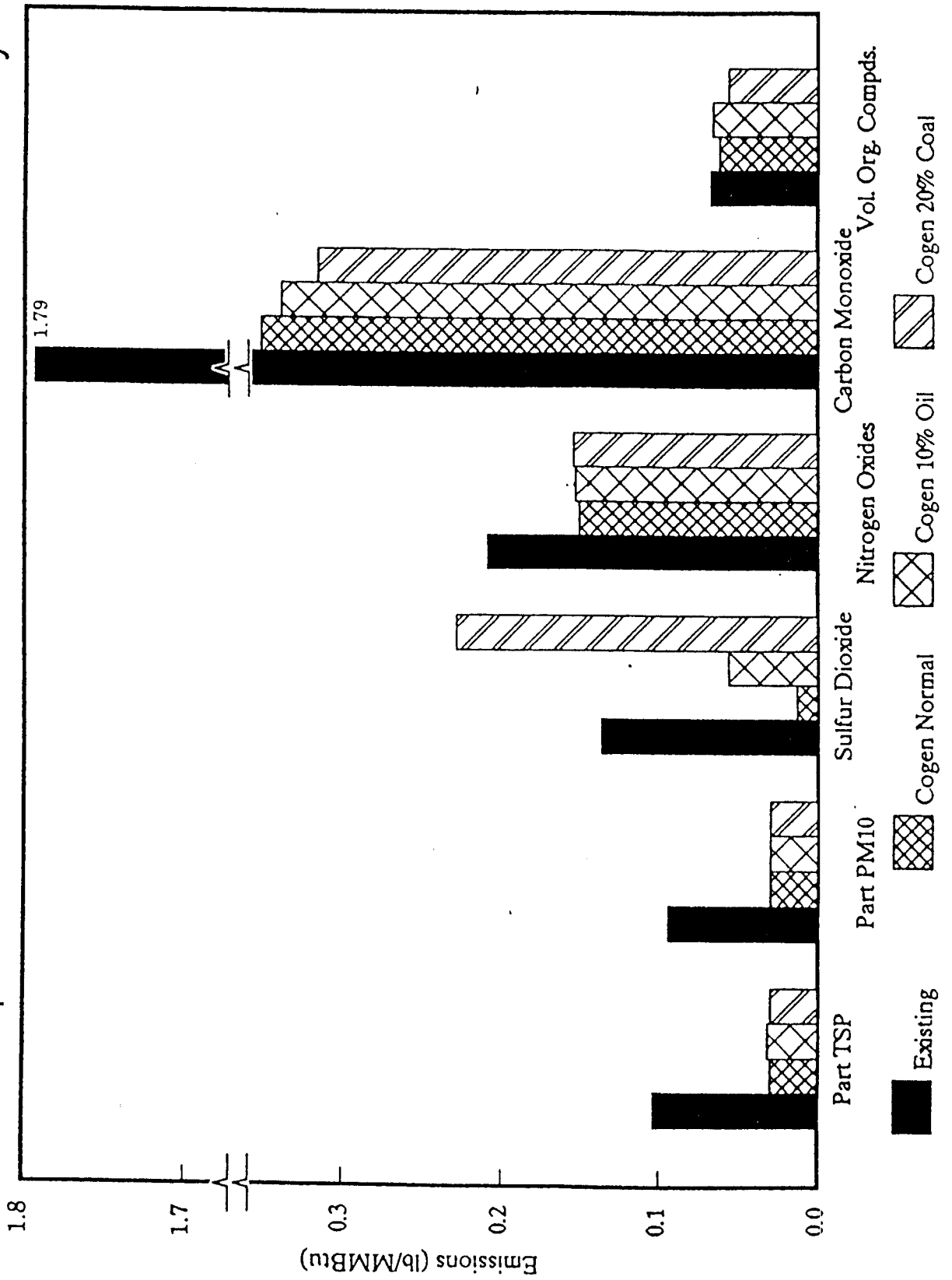
Comparison of Emission Rates for Okeelanta Facility



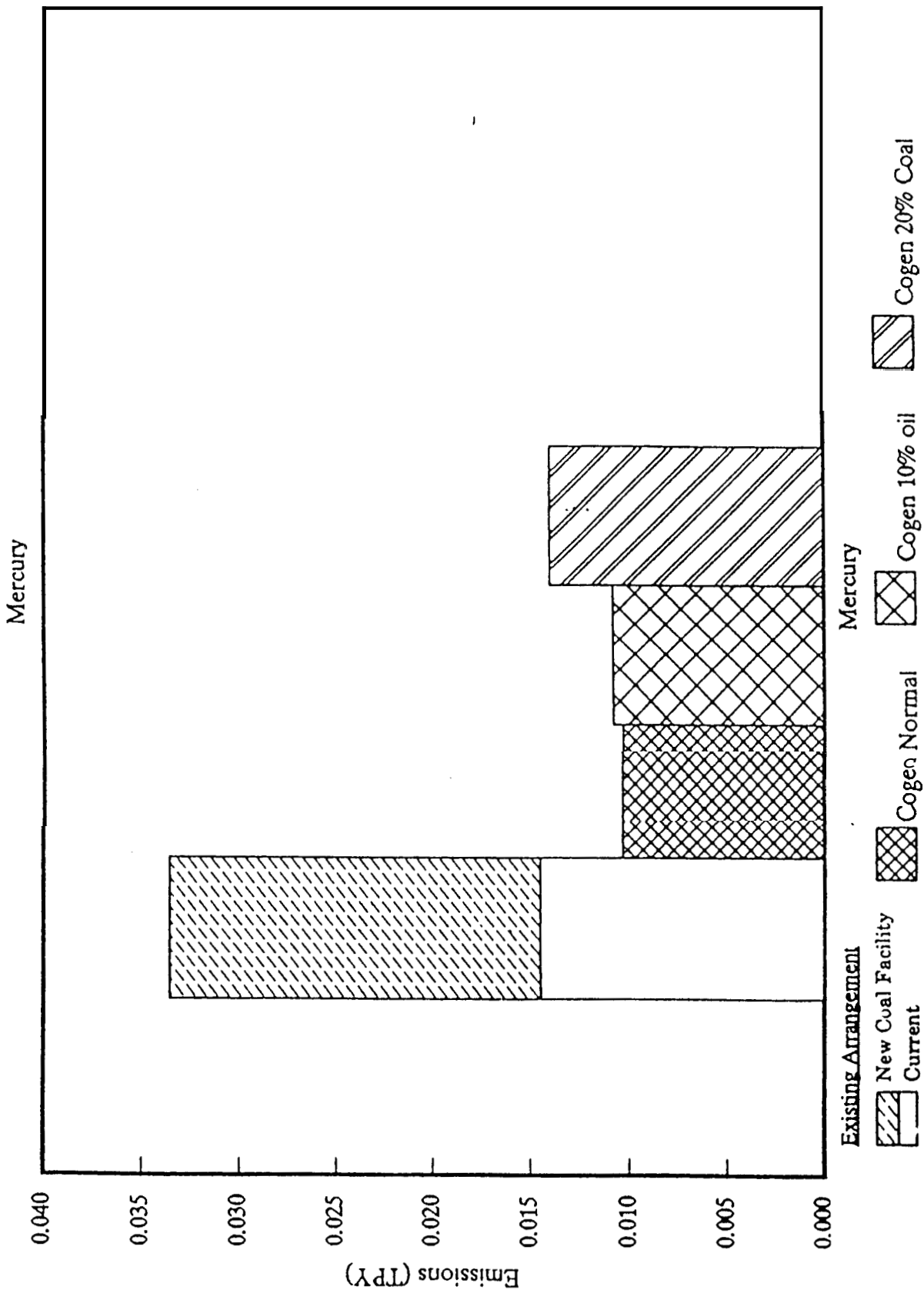
Comparison of Emission Rates for Osceola Facility



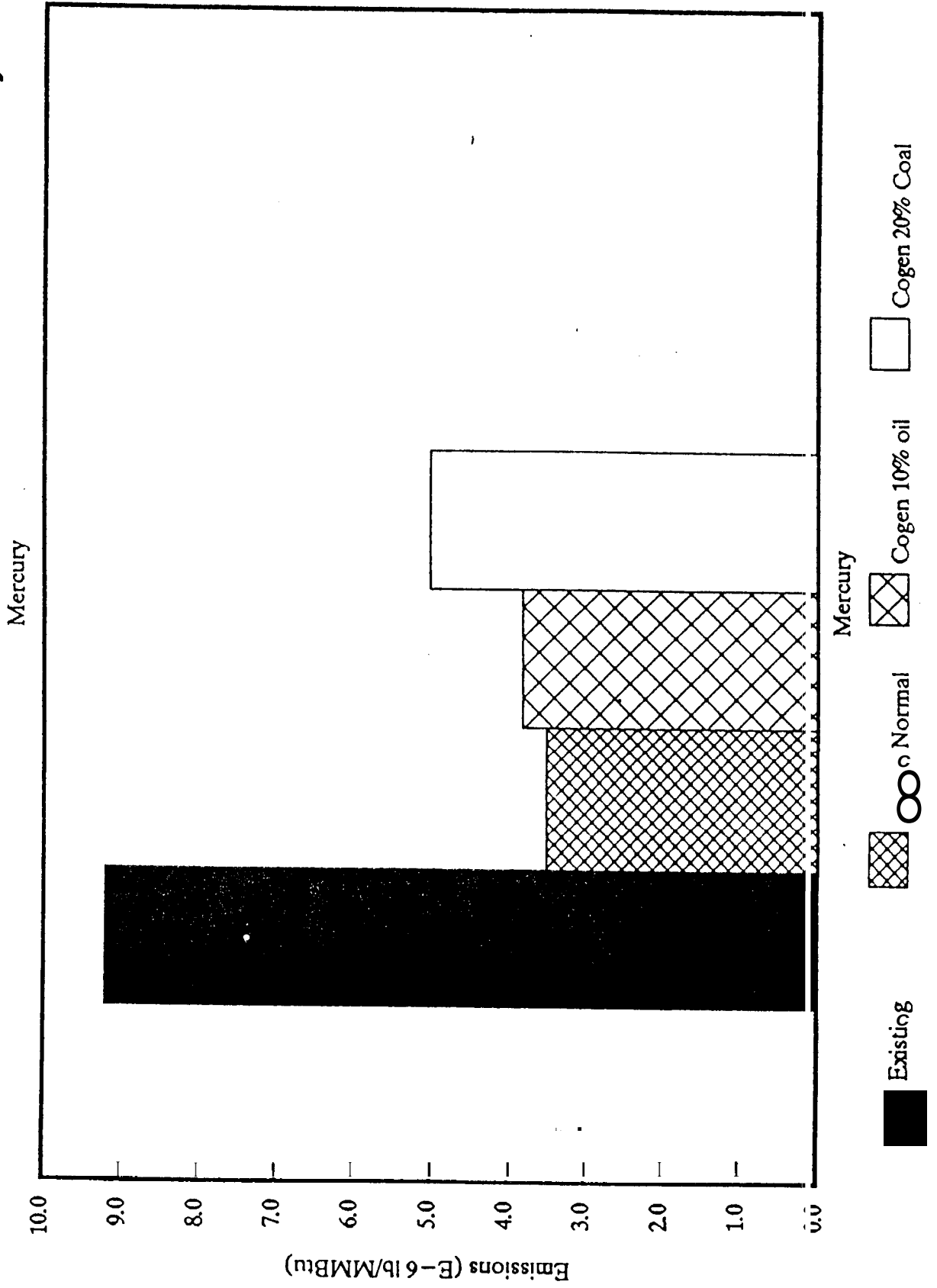
Comparison of Emission Rates for Osceola Facility



Comparison of Emission Rates for Osceola Facility

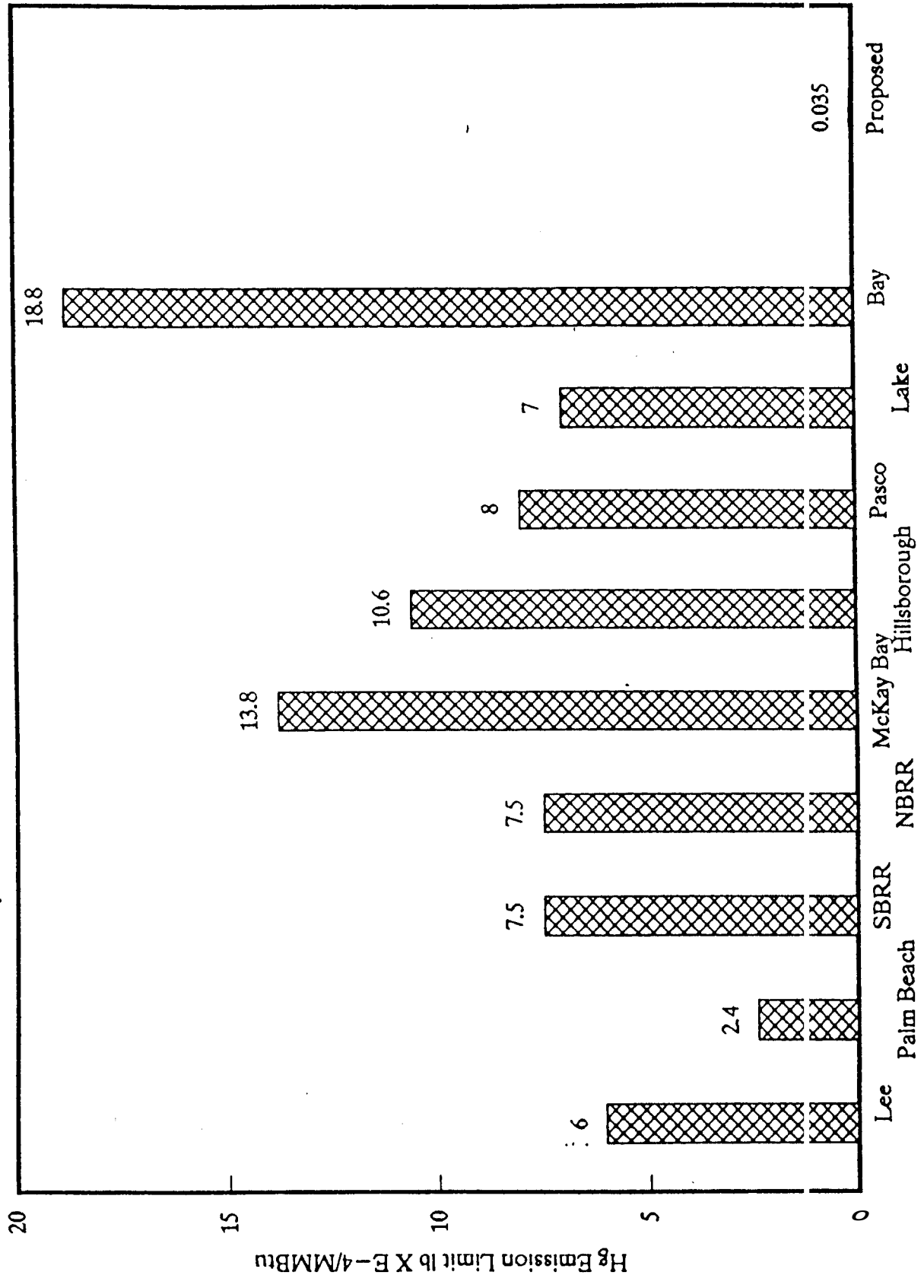


Comparison of Emission Rates for Osceola Facility



3-14

Comparison of Mercury Emission Limits



51-3

4.0 PROJECTS WILL HELP WASTE DISPOSAL PROBLEM

4.1 VOLUMES OF WASTE WOOD

The projects will help with the waste disposal problem in South Florida by using approximately 500,000 tons of wood waste per year. To provide some perspective to the figures the wood waste which would be **used** by the proposed projects is approximately equal to the wood waste generated by Palm Beach County. Therefore, it **is** evident that the projects can have a positive impact on the waste disposal equation for Palm Beach County and South Florida.

It should be noted that a large amount of the waste wood in South Florida **is** currently being landfilled. According to the "Solid Waste Management in Florida" 1990 Annual Report published **by FDER**, there is currently more than 6,500,000 tons of yard waste and construction and demolition debris generated in Florida each year. The report estimates that less **than 1,000,000** tons is being recycled. Even if recycling efforts increase dramatically in the future, it is expected that a significant percentage would still be landfilled. In fact, the Solid Waste Management Act states that no more than one-half of the recycling goal, or 2,900,000 tons in 1990, **can** be met with yard trash, white goods, construction and demolition debris, **and** tires. The projects do not wish to compete or interfere with efforts to recycle wood waste into compost or commercial mulch material. The projects will only target wood waste which is currently being landfilled.

4.2 QUALITY ASSURANCE SYSTEMS

4.2.1 PROCUREMENT

Okeelanta and Osceola have prepared specifications for the wood waste material which define the environmental parameters which are acceptable. For example the specifications **exclude** pressure or chemically treated materials or visible paint; and limit the percent of soil, sand **or** inorganic matter in the wood.

The projects will have a supplier qualification program to make sure potential suppliers have the capability to control the quality (i.e., conformance to specifications) **of** the wood waste material.

The wood waste supply agreements will incorporate the material specifications and will give the projects the right to reject non-conforming loads.

4.2.2 INSPECTION

Project representatives will have the right to inspect the site, facilities and equipment of all potential wood waste suppliers to make sure they have the capability to supply conforming wood waste material.

4.2.3 TESTING

The projects will develop the capability and systems to perform routine quality tests on the wood waste material delivered to the facilities to make sure such material conforms to specifications.

4.2.4 ON-SITE PROCESSING

Both sites will be designed with extensive on-site wood waste receiving, handling and processing equipment, including magnets to separate out tramp metal. The objective is to make sure the wood material sent to the boilers is physically clean and substantially free of inorganic particles.

In addition, the facility will be capable of storing up to 6 months of inventory and will have overflow capacity to handle excess material in the event of a hurricane or other special circumstance.

4.2.5 TRACE AMOUNTS OF TREATED WOOD

As explained earlier, the operators of the facilities will make every effort to eliminate chemically treated materials from the wood waste supply. Nevertheless, to evaluate a worst-case scenario, air modeling studies have been conducted to analyze the impact on air emissions if trace amounts of treated wood is inadvertently admitted into the wood supply. The results of this study indicate that the facilities could burn up to 5 percent treated wood and the emissions would still be below the "No Threat Levels" published by the Florida Department of Environmental Regulation (DER) for the relevant toxics.

APPENDIX A
SUPPORT FOR CALCULATION OF EMISSION RATES

Table A-1. Current Okeelanta Emissions

	Boilers 4-15 (TPY)	New Boiler # 10 (TPY)	Total (TPY)	Equivalent Emission Rate (lb/MMBtu)
PM (TPY)	504.1	23.1	527.2	0.146
PM10 (TPY)	458.4	11.6	470.0	0.131
SO _x (TPY)	674.2	132.9	807.1	0.224
NO _x (TPY)	798.4	77.5	875.9	0.243
CO (TPY)	10,094.0	86.1	10,180.1	2.828
VOC (TPY)	351.7	38.7	390.4	0.108
Hg (TPY)	0.0236	0.0013	0.0249	6.9 x 10 ⁻⁶
.....				
Heat Input (Btu/yr)				
Bagasse	5.84 x 10 ¹²	--		
Fuel Oil	0.50 x 10 ¹²	0.86 x 10 ¹²		
Total	6.34 x 10 ¹²	0.86 x 10 ¹²	7.20 x 10 ¹²	

Table A-2. Maximum Emissions for Proposed Okeelanta Cogeneration System

Regulated Pollutant	Bagasse		Wood Chips		No. 2 Fuel Oil		Coal		Annual Emissions (TPY) (lb/MMBtu)
	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	
Normal Operations									
Particulate (TSP)	0.03	89.9	0.03	52.9	--	0	--	0	142.8
Particulate (PM10)	0.03	89.9	0.03	52.9	--	0	--	0	142.8
Sulfur dioxide	0.0137	41.0	0.0114	20.1	--	0	--	0	61.2
Nitrogen oxides	0.15	449.4	0.15	264.7	--	0	--	0	714.1
Carbon monoxide	0.35	1,048.7	0.35	617.6	--	0	--	0	1,666.3
Volatile org. compds.	0.07	209.7	0.05	88.2	--	0	--	0	298.0
Mercury	5.50E-06	0.0165	2.9E-07	0.0005	--	0	--	0	0.0170
10% Oil Firing									
Particulate (TSP)	0.03	89.9	0.03	38.7	0.03	12.6	--	0	141.1
Particulate (PM10)	0.03	89.9	0.03	38.7	0.027	11.3	--	0	139.9
Sulfur dioxide	0.0137	41.0	0.0114	14.7	0.50	210.0	--	0	265.8
Nitrogen oxides	0.15	449.4	0.15	193.3	0.18	75.6	--	0	718.3
Carbon monoxide	0.35	1,048.7	0.35	450.9	0.20	84.0	--	0	1,583.6
Volatile org. compds.	0.07	209.7	0.05	64.4	0.09	37.8	--	0	312.0
Mercury	5.50E-06	0.0165	2.9E-07	0.0004	2.4E-06	0.0010	--	0	0.0179
20% Coal Firing									
Particulate (TSP)	0.03	89.9	0.03	24.4	--	0	0.03	25.2	139.5
Particulate (PM10)	0.03	89.9	0.03	24.4	--	0	0.03	25.2	139.5
Sulfur dioxide	0.0137	41.0	0.0114	9.3	--	0	1.20	1008.2	1,058.5
Nitrogen oxides	0.15	449.4	0.15	121.9	--	0	0.17	142.8	714.1
Carbon monoxide	0.35	1,048.7	0.35	284.3	--	0	0.15	126.0	1,459.0
Volatile org. compds.	0.07	209.7	0.05	40.6	--	0	0.015	12.6	263.0
Mercury	5.50E-06	0.0165	2.9E-07	0.0002	--	0	7.7E-06	0.0065	0.0232

Fuel	Firing Rate	Normal Operations		Emergency Operations	
		Normal Operations (Btu/yr)	10% Oil 20% Coal (Btu/yr)	10% Oil (Btu/yr)	20% Coal (Btu/yr)
Bagasse	705,00 TPY	5.99E+12	5.99E+12	5.99E+12	5.99E+12
Wood Chips	320,00 TPY	3.53E+12	1.62E+12	2.58E+12	1.62E+12
Oil	5,600,859 gal	0	8.40E+11	0	0
Coal	70,01 TPY	0	1.68E+12	0	1.68E+12
Total		9.52E+12	9.41E+12	8.57E+12	9.30E+12

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Table A-3. Comparison of Air Emissions for Okeelanta Cogeneration Facility

Parameter	Existing Arrangement ^a			Proposed Okeelanta Cogeneration Facility Normal Operation	Proposed Okeelanta Cogeneration Facility Emergency Operations 20% Coal 10% Oil
	Current Okeelanta Facility	New Coal-Fired Facility with BACT Emissions	Tons/Yr		
Particulate (TSP)	527.2	52.4	579.6	142.8	141.1
Particulate (PM10)	470.0	52.4	522.4	142.8	139.5
Sulfur Dioxide	807.1	445.4	1,252.6	61.2	265.8
Nitrogen Oxides	875.9	445.4 ^b	1,321.3	714.1 ^b	714.1 ^b
Carbon Monoxide	10,180.1	393.0	10,573.1	1,666.3	1,459.0
Vol. Org. Compds.	390.4	39.3	429.7	298.0	263.0
Mercury	0.0249 ^c	0.0288	0.0537	0.0170 ^d	0.0232 ^e
			<u>lb/MMBtu</u>		
Particulate (TSP)	0.146	0.02	0.093	0.030	0.030
Particulate (PM10)	0.131	0.02	0.084	0.030	0.030
Sulfur Dioxide	0.224	0.17	0.201	0.013	0.056
Nitrogen Oxides	0.243	0.17 ^b	0.212	0.150 ^b	0.153 ^b
Carbon Monoxide	2.828	0.15	1.700	0.350	0.314
Vol. Org. Compds.	0.108	0.015	0.069	0.063	0.057
Mercury	6.9 x 10 ⁻⁶	3.10 x 10 ⁻⁶	8.6 x 10 ⁻⁶	3.6 x 10 ⁻⁶	5.0 x 10 ⁻⁶
Heat Input (10 ¹² Btu/yr)	7.20	5.24	12.44	9.52	9.41
					9.30

^a These figures represent the emissions from the existing Okeelanta facility and a 69-MW coal-fired facility. This is equivalent to the energy output of the proposed cogeneration facility.

^b These figures reflect installation of thermal de-NO_x system with minimum NO_x removal efficiency of 40%.

^c This figure reflects current situation with no mercury control system.

^d Reflects minimum 30 percent control with mercury removal system.

Table A-4. Current Osceola Emissions

Parameter	Boilers 1-5 (TPY)	Equivalent Emission Rate (lb/MMBtu)
PM	340.0	0.181
PM10	306.0	0.163
SO ₂	198.6	0.106
NO _x	458.0	0.244
CO	6,241.5	3.320
VOC	217.2	0.116
Hg	0.0143	7.6 x 10 ⁻⁶

Heat Input (Btu/yr)		
Bagasse	3.61 x 10 ¹²	
Fuel Oil	<u>0.15 x 10¹²</u>	
Total	3.76 x 10 ¹²	

Table A-5. Maximum Emissions for Proposed Osceola Cogeneration System

Regulated Pollutant	Bagasse		Wood Chips		No. 2 Fuel Oil		Coal		Annual Emissions	
	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	Emission Factor (lb/MMBtu)	Emissions (TPY)	(TPY)	(lb/MMBtu)
Particulate (TSP)	0.03	54.2	0.03	34.7	--	0	--	0	88.9	0.030
Particulate (PM10)	0.03	54.2	0.03	34.7	--	0	--	0	88.9	0.030
Sulfur dioxide	0.0137	24.7	0.0114	13.2	--	0	--	0	37.9	0.013
Nitrogen oxides	0.15	270.9	0.15	173.7	--	0	--	0	444.6	0.150
Carbon monoxide	0.35	632.2	0.35	405.3	--	0	--	0	1,037.5	0.350
Volatile org. compds.	0.07	126.4	0.05	57.9	--	0	--	0	184.3	0.062
Mercury	5.5E-06	0.0099	2.9E-07	0.0003	--	0	--	0	0.0103	3.5E-06
Normal Operations										
10% Oil Firing										
Particulate (TSP)	0.03	54.2	0.03	25.8	0.03	7.8	--	0	87.9	0.030
Particulate (PM10)	0.03	54.2	0.03	25.8	0.027	7.1	--	0	87.1	0.030
Sulfur dioxide	0.0137	24.7	0.0114	9.8	0.50	130.8	--	0	165.3	0.056
Nitrogen oxides	0.15	270.9	0.15	129.2	0.18	47.1	--	0	447.2	0.153
Carbon monoxide	0.35	632.2	0.35	301.5	0.20	52.3	--	0	986.0	0.337
Volatile org. compds.	0.07	126.4	0.05	43.1	0.09	23.5	--	0	193.1	0.066
Mercury	5.5E-06	0.0099	2.9E-07	0.0002	2.4E-06	0.0006	--	0	0.0108	3.7E-06
20% Coal Firing										
Particulate (TSP)	0.03	54.2	0.03	17.0	--	0	0.03	15.7	86.8	0.030
Particulate (PM10)	0.03	54.2	0.03	17.0	--	0	0.03	15.7	86.8	0.030
Sulfur dioxide	0.0137	24.7	0.0114	6.4	--	0	1.20	627.7	658.9	0.228
Nitrogen oxides	0.15	270.9	0.15	84.8	--	0	0.17	88.9	444.6	0.154
Carbon monoxide	0.35	632.2	0.35	197.8	--	0	0.15	78.5	908.4	0.314
Volatile org. compds.	0.07	126.4	0.05	28.3	--	0	0.015	7.8	162.5	0.056
Mercury	5.5E-06	0.0099	2.9E-07	0.0002	--	0	7.7E-06	0.0040	0.0141	4.9E-06
Emergency Operations										
10% Oil 20% Coal										
Fuel	Firing Rate	Normal Operations (Btu/yr)	10% Oil (Btu/yr)	20% Coal (Btu/yr)						
Bagasse	425,000 TPY	3.61E+12	3.61E+12	3.61E+12						
Wood Chips	210,000 TPY	2.32E+12	1.72E+12	1.13E+12						
Oil	3,487,282 gal	0	5.23E+11	0						
Coal	43,591 TPY	0	0	1.05E+12						
Total		5.93E+12	5.93E+12	5.79E+12						

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Table A-6. Comparison of Air Emissions for Osceola Cogeneration Facility

Parameter	Tons/Yr			Proposed Osceola Cogeneration Facility Normal Operation	Proposed Osceola Cogeneration Facility Emergency Operations 10% Oil 20% Coal
	Current Osceola Facility	New Coal-Fired Facility with BACT Emissions	Total		
Particulate (TSP)	340.0	34.9	374.9	88.9	87.9
Particulate (PM10)	306.0	34.9	340.9	88.9	87.1
Sulfur Dioxide	198.6	296.7	495.3	37.9	165.3
Nitrogen Oxides	458.0	296.7 ^b	754.7	444.6 ^b	447.2 ^b
Carbon Monoxide	6,241.5	261.8	6,503.3	1,037.5	908.4
Vol. Org. Compds.	217.2	26.2	243.4	184.3	193.1
Mercury	0.0143 ^c	0.0192	0.0335	0.0103 ^d	0.0108 ^d
			<u>lb/MMBtu</u>		
Particulate (TSP)	0.181	0.02	0.103	0.030	0.030
Particulate (PM10)	0.163	0.02	0.094	0.030	0.030
Sulfur Dioxide	0.106	0.17	0.137	0.013	0.056
Nitrogen Oxides	0.244	0.17 ^b	0.208	0.150 ^b	0.154
Carbon Monoxide	3.320	0.15	1.794	0.350	0.337
Vol. Org. Compds.	0.116	0.015	0.067	0.062	0.066
Mercury	7.6 x 10 ⁻⁶ ^c	11.0 x 10 ⁻⁶	9.2 x 10 ⁻⁶	3.5 x 10 ⁻⁶ ^d	3.7 x 10 ⁻⁶ ^d
Heat Input (10 ¹² Btu/yr)	3.76	3.49	7.25	5.93	5.86

^a These figures represent the emissions from the existing Osceola facility and a 44-MW coal-fired facility. This is equivalent to the energy output of the proposed cogeneration facility.

^b These figures reflect installation of thermal de-NO_x system with NO_x removal efficiency of 40%.

^c This figure reflects current situation with no mercury control system.

^d Reflects 30 percent control with mercury removal system.

Table A-7. Comparison of Mercury Emission Limits for Florida Resource Recovery Facilities and Proposed Cogeneration Facilities

Facility	Hg Emission Limit	
	lb/MMBtu	lb x 10 ⁻⁴ /MMBtu
Lee County	0.00060	6.0
Palm Beach County	0.00024	2.4
South Broward County	0.00075	7.5
North Broward County	0.00075	7.5
McKay Bay/Tampa ^a	0.00138	13.8
Hillsborough County ^c	0.00106	10.6
Pasco County	0.00080	8.0
Lake County ^b	0.00070	7.0
Bay County	0.00188	18.8

Proposed Cogen Facilities	0.0000035	0.035

^a Assuming 5,200 Btu/lb for MSW.

^b Based on 3.4 x 10⁻⁴ gr/dscf = 0.00730 lb/ton.

MERCURY EMISSION FACTORS

I. Current Okeelanta

A. Bagasse: Assume equal to mercury content in dead sugar cane leaves

0.068 ppm (dry) = 0.033 ppm wet @ 51.7% H₂O
(Reference: Bill Patrick, LSU)

$$2,000 \text{ lb/ton} \times 0.033/10^6 = 6.6 \times 10^{-5} \text{ lb/ton}$$

$$\text{Bagasse} = 4,250 \text{ Btu/lb}$$

$$6.6 \times 10^{-5} \text{ lb/ton} \times \text{ton}/(2,000 \text{ lb} \times 4,250 \text{ Btu/lb}) \\ = 7.8 \times 10^{-6} \text{ lb/MMBtu}$$

B. No. 6 Oil: Average 5.5×10^{-4} lb/1,000 gal

$$5.5 \times 10^{-4} \text{ lb/1,000 gal} + 150,000 \text{ Btu/gal} = 3.7 \times 10^{-6} \text{ lb/MMBtu}$$

C. Wood: TAPPI Environmental Conference--3 boilers average 0.23
 $\mu\text{g/dscm}$ in exhaust gases = 0.41×10^{-6} lb/MMBtu

D. No. 2 Oil: 4.7×10^{-4} lb/1,000gal = $3.4 \text{ lb}/10^{12} \text{ Btu}$
= 3.4×10^{-6} lb/MMBtu

II. Proposed Cogeneration System

Mercury control system (i.e., carbon adsorption) will be employed:
minimum 30% removal on all fuels

$$\text{Bagasse: } 7.8 \times 10^{-6} \text{ lb/MMBtu} \times (1 - 0.30) = 5.5 \times 10^{-6} \text{ lb/MMBtu}$$

$$\text{Wood: } 0.41 \times 10^{-6} \text{ lb/MMBtu} \times (1 - 0.30) = 0.29 \times 10^{-6} \text{ lb/MMBtu}$$

$$\text{No. 2 Oil: } 3.4 \times 10^{-6} \text{ lb/MMBtu} \times (1 - 0.30) = 2.4 \times 10^{-6} \text{ lb/MMBtu}$$

$$\text{Coal: } 11 \text{ lb} \times 10^{-6} \text{ lb/MMBtu} \times (1 - 0.30) = 7.7 \times 10^{-6} \text{ lb/MMBtu}$$

APPENDIX B
PERMITS REQUIRED BY PROPOSED PROJECTS

Approval and Permit Requirements for the Okechanta Cogeneration Facility (Page 1 of 4)

Approval	Regulated Activity	Agency	Authority	Key Information Requirements	Applicability ^a
<u>Federal Approval/Permits</u>					
Water Discharge to Surface Waters of U.S.; NPDES Permit	Quality and quantity of water discharge	EPA	40 CFR 423 40 CFR 123	Type and location of discharge; quality of effluent	Not required
Stormwater Discharge to Surface Waters of the U.S.; NPDES Permit	Quality of Stormwater discharge	EPA	40 CFR 122	Type and location of discharge; quality of discharge; stormwater management plan; Identification of materials and storage areas.	Potentially required; potential monitoring
PSD Permit	Air quality impact and emissions	EPA	40 CFR 52.21	Air modeling impact analysis and BACT analysis	Required but full authority given to FDER
NSPS; Air Emission Standards	Air emissions	EPA	40 CFR 60, Subparts GG and Dc or Db	Data to ensure technological limits are achieved	Subpart Da required; post-construction notifications to FDER
Dredge and Fill of Wetlands	Filling of isolated wetlands	USACE	Nationwide 26 Permit 33 CFR 330	Type, quantity of material and acreage to be filled	Not Required
Permit for Obstructions That May Affect Navigable Airspace	Stack height	FAA	14 CFR 77	Stack height greater than 200 feet; distance from airport	Requires FAA Notification
Endangered Species Determination	Impacts to endangered and threatened species and their habitats	USFWS	50 CFR 17	Ecological surveys	Not required; no critical habitat on proposed site
Environmental Impact Statement (EIS)	Overall environmental impacts resulting from federal action (permit or approval)	Federal agency issuing permit/approval (e.g., EPA or USACE)	40 CFR 1500	Baseline environmental analyses	Not required; no federal approval for PSD

Approval and Permit Requirements for the Okelania Cogeneration Facility (Page 2 of 4)

Approval	Regulated Activity	Agency	Authority	Key Information Requirements	Applicability ^a
<u>State Permits</u>					
Solid Waste	Solid waste disposal	FDER	403, FS Ch. 17-17, F.A.C.	Waste characterization; disposal location; if disposal site is not an existing, permitted facility (i.e., landfill), design will be required	Information required; volume of solid wastes must be addressed
State Wastewater Permit and Underground Injection Control Permit	Operation of industrial wastewater system and deep well injection of wastewater	FDER	403, FS Ch. 17-3, F.A.C. Ch. 17-4, F.A.C. Ch. 17-660, F.A.C. Ch. 17-28, F.A.C.	Volume and water quality of effluent; treatment processes used; delineation of zone of injection	Potentially required (Note: see Regional Permit Compliance—Stormwater Permit)
Groundwater Discharge Permit	Quality of discharge to groundwater	FDER	Ch. 17-3, F.A.C. Ch. 17-4, F.A.C.	Volume and water quality of effluent	Not required
PSD Permit—Operation and Construction Permit for Air Pollution Sources	Air emissions and air quality impacts	FDER	Ch. 17-2.6609, F.A.C. Ch. 17-2.500, F.A.C. Ch. 17-2.510, F.A.C.	New source review—PSD, nonattainment; NSPS; BACT	Required; modeling and BACT analysis required; monitoring exemption may be available
<u>Regional Permit Compliance</u>					
Consumptive Use Permit	Consumptive withdrawal of groundwater	SFWMD	Ch. 40E-2, F.A.C.	Definition of water availability; impacts to water quality	Potentially required, quality and impacts on Biscayne aquifer must be available
Stormwater Permit	Quality of discharge of storm water from new construction	SFWMD (Note: If a State Wastewater Permit is required, jurisdiction may revert to FDER with SFWMD review)	Ch. 17-25, F.A.C. Ch. 40E-4, F.A.C.	Site layout; retention/detention facilities location and design	General permit required; monitoring may be required; runoff from industrial areas (power block, fuel storage) must be segregated from general site runoff and treated as a wastewater discharge (Note: See State Wastewater Permit)

Approval and Permit Requirements for the Okelanta Cogeneration Facility (Page 3 of 4)

Approval	Regulated Activity	Agency	Authority	Key Information Requirements	Applicability ^a
Surface Water Management	Surface water including wetlands	SFWMD	Ch. 40E-4, F.A.C.	Site layout; retention/detention facilities location and design	General permit required; no monitoring required; segregate contaminated flows (see stormwater permit); avoid reduction of floodplain storage/encroachment
Dredge and Fill	Filling of isolated wetlands	FDER	Ch. 17-4, F.A.C.	Type and quantity of material to be dredged and filled	Not required; no wetlands on proposed site
Works of the District	Use of water management facilities controlled by the water management district	SFWMD	Ch. 40E-6, F.A.C.	Site layouts location of works of the district	Not required; no use of water management district facilities
Land Use	Prohibits or restricts use or effects to designated areas	Various	DOA-coastal zone areas (380.19 FS, 380.23, FS); environmentally endangered land (259, FS); areas of critical concern (380, FS); aquatic preserves (258.35, FS); outstanding Florida waters (Ch. 17-3, 041, F.A.C.) (259, FS) (258, FS) (Ch. 17-3, F.A.C.); national and state parks and recreation areas (592.12, FS); national forests national wildlife refuges, and state wildlife management areas (372, FS); state wilderness areas (258.17, FS); Indian reservations (285, FS)	Description of potential impacts to designated land uses	Not required; none of the designated land areas to be impacted
Archaeological/ Historical	Prohibits impacts to archaeological and historical sites	DOS	267, FS Ch. 1A-2, F.A.C.	Archaeological survey/ impact analysis	No archaeological or historical sites will likely be impacted due to the use of a disturbed site

Approval and Permit Requirements for the Okelanta Cogeneration Facility (Page 4 of 4)

Approval	Regulated Activity	Agency	Authority	Key Information Requirements	Applicability ^a
Driveway Permit	Access to land from state roads	FDOT	Utility accommodation guide	Location, geometry, and curb-cut width of access road	Not required, access existing
<u>Local Permits Compliance</u>					
Site Plan Approval	Land use, noise, stormwater management, parking, setbacks, height	Board of County Commissioners; Pollution Control Board	Local ordinances	Site plan with details to demonstrate compliance with codes	Site plan approval may be required; must comply with land development regulations

Note: NA = not applicable.

- Agencies:
- DOA = Department of Administration.
 - DOS = Department of State, Division of Historical Resources
 - EPA = U.S. Environmental Protection Agency.
 - FAA = Federal Aviation Administration.
 - FDER = Florida Department of Environmental Regulation.
 - FDOT = Florida Department of Transportation.
 - NPDES = National Pollutant Discharge Elimination System.
 - SFWMD = South Florida Water Management District.
 - USACE = U.S. Army Corps of Engineers.
 - USFWS = U.S. Fish and Wildlife Service.

^aFor state, regional, and local requirements, applicability refers to information requirements