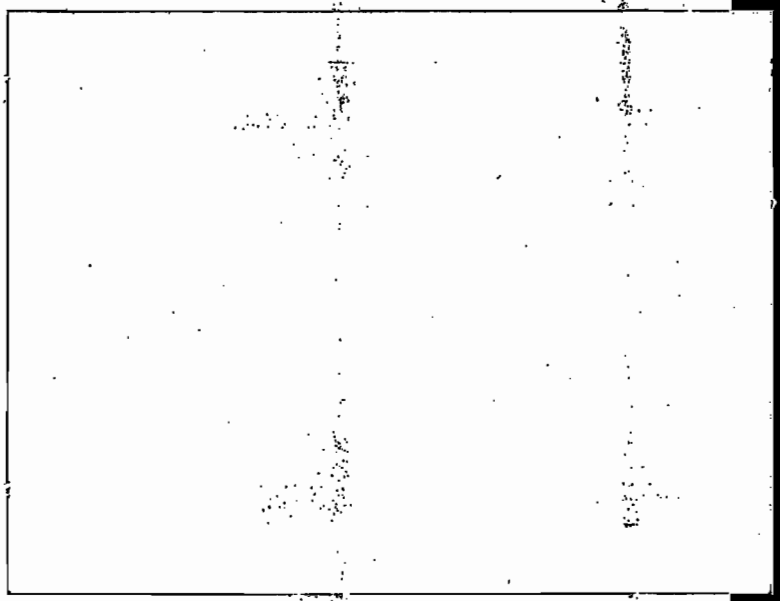

QUALITY

♦

INTEGRITY

♦

CREATIVITY

♦

RESPONSIVENESS

RUST ENVIRONMENT & INFRASTRUCTURE

SO2 emissions permitting file

for

TITLE V AIR PERMITTING PROJECT
at

BBA inc. Jacksonville, Fl

RUST E & I project # 87534
date prepared: 6/14/95
prepared by: Suresh Chandnani, P.E., CHMM
Project manager
RUST E & I, Jacksonville, Fl.

RUST ENVIRONMENT & INFRASTRUCTURE

RUST Environment & Infrastructure Inc.
370 S. North Lake Boulevard, Suite 1028
Altamonte Springs, FL 32701
Tel. (407) 331-5967 • FAX (407) 331-0025

June 23,1995

To,

Mr. Howard Rhodes, P.E
Director, Division of Air Resources Management,
Florida Department of Environmental Protection,
2600 Blairstone Road,
Tallahassee, Florida 32399-2400

SUBJECT: Permitting of SO2 emissions at Bush Boake Allen, Inc.(BBA), Jacksonville,Fl

Dear Mr. Rhodes:

BBA is a permitted air pollution facility located in Duval county. It is a major source of air pollution for SO2 . The facility processes crude sulfate turpentine(CST) and manufactures a variety of terpene-based derivative compounds. TRS and VOC vapors are collected and combusted in either or both of the two 77.5MM Btu/hr boilers for VOC and odor control.(See exhibit 1 for a summary of historical developments related to TRS odor control project.) The two boilers were constructed in 1974 and 1980.The boilers are permitted to burn fuel oil as standby fuel with a sulfur content not toexceed 0.7%. The total SO2 emissions from the two boilers are restricted to 250tpy and 249tpy by FDEP's operating permit. The boilers are subject to the monitoring requirements of JEPB rule 5, which requires controlling TRS vapors to less than 1ppm.

Permitting Issues of concern to BBA:

Since 1970, all the air construction and operating permits have been silent about the SO2 emissions resulting from combustion of the TRS vapors. The reason for this stems from FDEP's policy dating back to 1970's wherein FDEP agreed to ease the permitting burden from TRS incineration in return for benefits of odor reduction. Futhermore in 1986, under the TRS rule (for Kraft pulp mills) FDEP indicated in the implementation handbook that sulfur dioxide emissions from incineration of TRS vapors do not trigger PSD review. The local program and FDEP applied the same policy to other significant sources of TRS primarily the two local turpentine processing facilities.

In preparation of the Title V permit applications, BBA is required to quantify all emissions. The SO2 emissions from the two boilers during 1994 calender year were 740 TPY . This number represents the SO2 emissions from TRS combustion in the boiler and natural gas firing to meet the steam demand. There is a potential for the 740 tpy number to increase further due to variations in and increasing trend of sulfur content in the crude turpentine (see Exhibit #2) received by this facility from pulp and paper mills as well as increases in the amount of crude sulfate turpentine processed within the existing plant capacity . As a result of the above developments, we would like to clarify and confirm the following issues with FDEP prior to preparation of Title V application for this BBA facility:

1) As a result of FDEP's past policies and interpretations derived from TRS rule of 1986,. This facility is not subject to PSD review for SO2 emissions. This facility also did not trigger NSR review due to any " major Modification" as defined by Rule 62-212.400(c). The facility also had capability to accomodate increases in sulfur concentration in crude sulfate turpentine and the resulting vapors at the worst case conditions prior to January 6,1975. This issue has been researched thoroughly using the most recent USEPA guidance memos by RUST and BBA's technical and legal staff.(see Exhibit # 3 for detail assesment by RUST E & I) Since PSD was not triggered, BBA requests confirmation that PSD increment consumption modeling is not neccessary. Jacksonville RESD has already performed modeling to determine ambient air concentration for all significant sources in the Jacksonville area using the worst case SO2 emission numbers from BBA facility. The result of this modeling indicates that even at worst case conditions(3337 tpy of SO2 emissions , 250 tpy from Boiler # 2 and 3087 tpy from Boiler # 3) the 24hr ambient air concentration standard of 260 ug/m3 will not be violated. (24 hr SO2 concentration from ISCST2 modeling was 207 ug/m3 at 93 ft stack height). BBA recognizes that at this level of SO2 emissions, stack height increases may be neccesary to ensure compliance with ambient air quality standard for SO2. BBA would be receptive to a compliance plan to increase stack height if, at some time in the future, emissions reach a level that would trigger the need for a height increase.

2) It is presumed that FDEP may require an emission limit under the Title V permit for SO2 from combustion of fuel as well as from incineration of TRS vapors . FDEP and BBA need to agree on a new emission limit which would be included in Title V permit.This would be an aggregate limit for both boilers, since both incinerate TRS simultaneously.

3) BBA and FDEP should also agree on an acceptable compliance monitoring plan for SO2 emissions which can be incorporated into the Title V application for this facility. BBA propses to determine SO2 emissions resulting from TRS incineration by slightly conservative assumption that 100% of the sulfur in the CST feedsstock is removed, incinerated and emitted as SO2, based on quarterly composite analysis of CST material receipts and the amount of CST feed to the process. This method has historically been used to calculate emissions for BBA's annual operating report and would be the basis for Title V pollutant license fee determinations.

4) FDEP is requested to provide guidance on how future increases of SO2 emissions from TRS vapor incineration for controlling odor will be permitted and accounted for in determining whether the ambient air quality standards will be met in the local region surrounding this facility.

On behalf of BBA , we would like to request FDEP to provide us with their position on the issues addressed above. We are including relevant backup documentation for FDEP to conduct their own analysis. Since timing is important on the resolution of these issues, we are requesting a response within two weeks. If FDEP staff has any questions pertaining to this issue, please contact me immediately at (407)-331-5967 or (904)-363-9999. We look forward to hearing from you soon in this regard,

Sincerely,

Suresh Chandnani, P.E , CHMM
Project Manager,
RUST Environment and Infrastucture, Inc.
Jacksonville, Florida.

cc: Bill Van Duyn, BBA, inc., Jacksonville, Fl
Roger Chubin, BBA inc, Jacksonville, Fl

encl.

Exhibit # 1

History of TRS Incineration at BBA
(Excerpt from W.B. Van Duyn memo to L. H. Stebbins, RUST E&I, dated 10/25/94)

The purpose of the following discussion is to promote an understanding of the history of TRS incineration for odor control at the BBA facility and the history of the permitting of its incineration, in order to guide the future permitting strategy.

On December 31, 1970, Union Camp Corporation (the former site owner and majority owner of BBA) applied to the Florida Department of Air and Water Control (predecessor of FDEP) to obtain a "Permit to Operate Air Pollution Control Facilities" for a flare to incinerate TRS vapor removed from crude sulfate turpentine. The application recognized a potential of 2,100 lbs SO_2 per day (383 TPY) based on the sulfur content of the turpentine, of which 312 lbs/day (57 TPY) would be emitted to the atmosphere from the vapor flare. The application also referred to a companion application (since lost) for an incinerator to burn a TRS-rich liquid stream emitting another 720 lbs/day (131 TPY), for total SO_2 emissions of 188 TPY. The remaining TRS was considered to remain in the products or to be lost as uncontrolled emissions. File documents indicate that permit #AT-16-172 was issued for the vapor flare and permit #AT-16-170 for the liquid incinerator. The permits themselves were lost, presumably in the fire that burned down our office building and most of our records circa 1972.

Following a study into a continuing TRS odor problem and a presentation to the Jacksonville Air Pollution Control Board, a construction permit application was submitted for a new TRS waste vapor and liquid incinerator. (This incinerator still exists, although it is not operating, and is covered by permit #AO16-218166, which expires September 30, 1997.) Accompanying the new incinerator was the relocation of the old vapor flare to the site of the new incinerator (to be used as a backup vapor incinerator) and the construction of a new vapor collection system connected to several additional TRS emission sources; primarily storage tanks. Construction permit #AC-491 was issued October 16, 1972. The initial operating permit was #SO16-2093. Although this project increased the emission of SO_2 resulting from the improved capture of TRS, the permit application, construction permit, operating permit and related correspondence remaining in our files are all silent on the emission of SO_2, except that the initial operating permit required submittal of an annual emissions report.

A subsequent operating permit renewal application was submitted on October 29, 1982, using the long form as requested by BESD. The purpose of the incinerator (to incinerate TRS) was mentioned, but nowhere were SO_2 emissions mentioned. The application noted the configuration of an expanded vapor collection system to collect additional sources of TRS and product VOC vapors, as directed by the city according to the terms of several construction permits for other sources.

The next renewal application was submitted on September 10, 1987, noting further expansion of the vapor collection system and connection of the vapor collection system to the boilers for alternate incineration capability.

A letter dated February 6, 1989 from Union Camp to BESD, concerning a proposed odor abatement compliance plan, discussed further upgrades to the vapor collection system and parallel operation of the boilers and the incinerator for the incineration of malodorous vapors, the collected vapors being distributed between the boilers and the incinerator for improved control.

The oldest of our two operative boilers, B-900D, (permitted as Boiler #2), was constructed in 1974. The construction permit, AC16-2194, was issued March 21, 1974 based on an application submitted December 14, 1973. SO_2 emissions were based on burning fuel oil with an allowable emission rate of 0.8 lbs SO_2/MBTU. At the maximum rate of 73,808,640 BTU/hr this would produce 258.6 TPY of SO_2. The boiler was also permitted to burn natural gas at a maximum rate of 77.5 MBTU/hr. In the first operating permit the SO_2 limit was expressed as a 0.7% maximum sulfur limit on the fuel oil, fired at a maximum rate of 73.8 MBTU/hr.

Our other operative boiler, B-900E, (permitted as Boiler #3), was constructed in 1980. The construction permit, AC16-11888, was issued October 5,1978 based on an application submitted July 27, 1978. This boiler is essentially identical to the other and was permitted on the same operating basis. However, the initial operating permit, AO16-3678, issued July 29,1981, noted an adjusted SO_2 limit of 249 TPY, expressed as a limitation in operating hours on fuel oil to 8,616 hrs/yr.

A permit revision issued January 15, 1982 for Boiler #2 expressed a maximum SO_2 emission rate of 57.1 lb/hr, or 250 TPY, (vs. 258.6 TPY in the construction permit), but the fuel sulfur limit remained at 0.7% and the operating hours at 8,760.

On January 15, 1982 the operating permits were revised to allow turpentine and derivatives (but not CST) as alternate fuels up to 5.5M gal/yr (facility limit for both boilers) with a 0.2% sulfur limit. The revision for Boiler No. 3 also expressed a maximum SO_2 emission rate of 57.8 lbs/hr and 249 TPY.

Both boilers presently operate under a single permit, AO16-197534. The boiler permits have never been revised to explicitly recognize the incineration of TRS and VOC vapors, although this was being done at RESD's behest. However, the boilers are subject to monitoring requirements for VOC destruction and TRS emission and are subject to JEPB Rule 5 because of their use for vapor incineration.

The boilers were modified (in the engineering sense, but not the regulatory sense) in 1992-1993. The boilers were modified by installing new burners, designed specifically for efficient dual fuel (gas/liquid) capability and the incineration of waste vapors, and a new burner management system. The modification had several objectives: to meet the requirements of the BIF rule, to incinerate VOC and TRS more reliably and efficiently (providing better assurance of meeting the 1 PPM TRS emission limit imposed by JEPB rule 5), and to allow the incinerator to be retired. The aging incinerator could be retired by incinerating all VOC and TRS in either boiler with the other boiler providing backup capability. The vapor collection system was modified to better direct all vapors to the boilers, its scavenging capability was increased, additional sources were connected, and the vapor duct was hard-piped to the new burners, eliminating odors around the boilerhouse from the former "soft" connections to the boiler air handlers.

During the planning stage for the modification, correspondence was exchanged with RESD, informing them of our plans and presenting our view that the project did not constitute a "modification" according to the regulatory definition, because there would be no increase in emissions; therefore, a construction permit would not be required. RESD concurred in this view and stated that the operating permits would be amended after the fact to reflect the changes in configuration and operation. This was followed by our letter to RESD dated February 26, 1992 to present our plans in greater detail, and by a presentation to RESD staff on March 3. RESD replied in a letter dated March 4, 1993 stating that it foresaw no objection to our plan. It was recognized that incineration of VOC and TRS

solely in the boilers would reduce emissions due to more reliable operation and more efficient combustion, and would reduce emissions from fuel combustion by retirement of the incinerator.

Finally, our letter to Ron Roberson (RESD) dated June 23, 1994 discussed permit extensions by rule (62-213) and the boiler permit revision. It documented his agreement that revision to our boiler permit could wait to be incorporated into our Title V permit application, rather than our existing operating permit. This revision would reflect the operation of the boilers as the sole control devices for the incineration of TRS and VOC vapors, and would update the configuration of the vapor collection system.

In summary, the incineration of TRS and the resultant emission of SO_2 has been recognized by the permitting agencies (RESD and FDEP) from the beginning to the present, except that the permits, by policy, have always been silent regarding this source of SO_2. The calculated actual emissions of SO_2 have long been reported on our Annual Operating Report, reflecting a long term trend of increased turpentine throughput and increased sulfur content.

Exhibit #2

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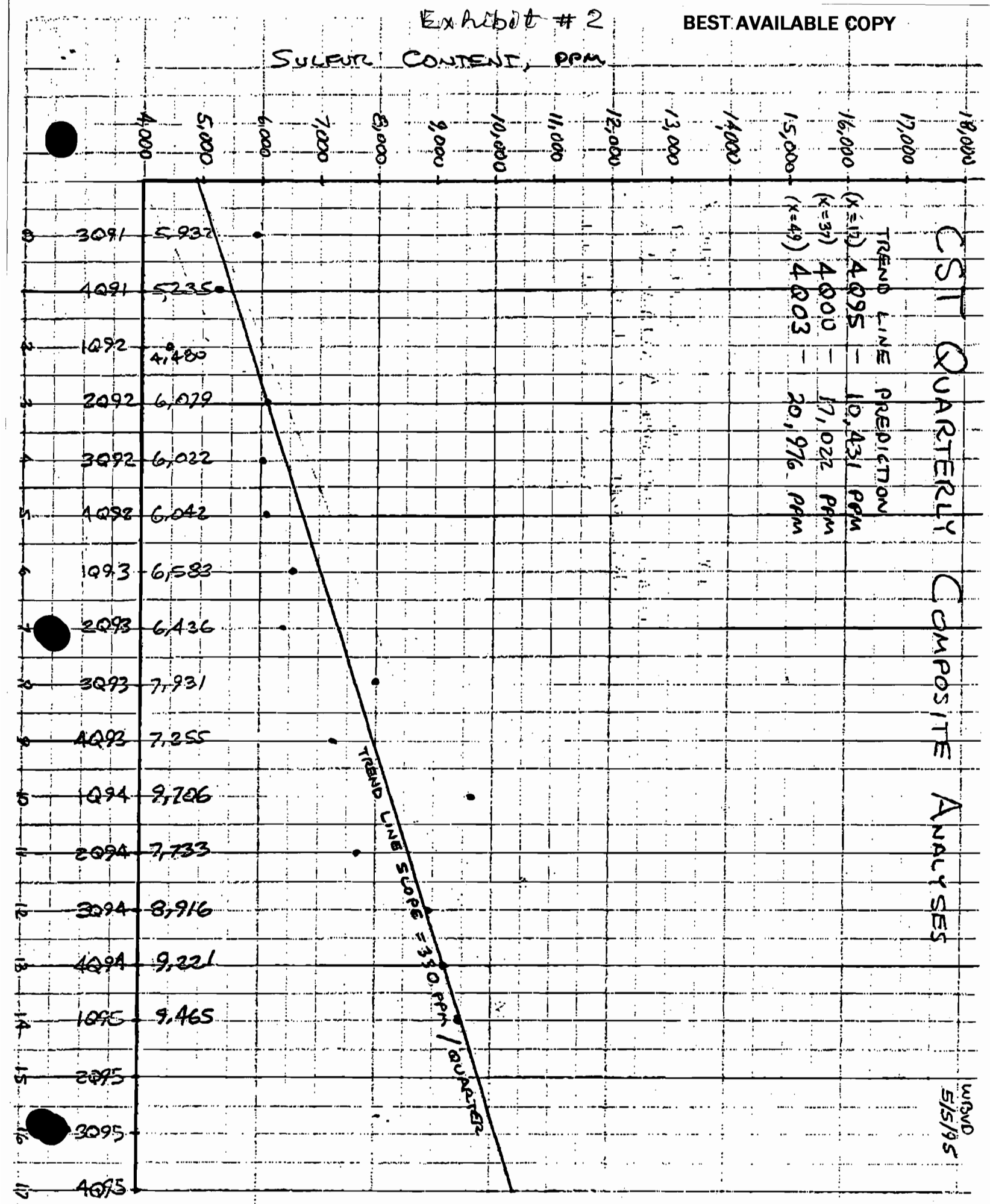

exhibit # 3

RUST ENVIRONMENT & INFRASTRUCTURE

RUST Environment & Infrastructure Inc.
Freedom Commerce Centre
8375 Dix Ellis Trail, Suite 402
Jacksonville, FL 32256
Tel. (904) 363-9999 • FAX (904) 363-9932

December 20, 1994

William B. Van Duyn
Bush Boake Allen Inc.
2051 N. Lane Avenue
Jacksonville, FL 32254

Subject: Prevention of Significant Deterioration (PSD) Considerations

RE: (1) Letter from W. B. Van Duyn to L. H. Stebbins, dated October 25, 1994
(2) Telcon from L. H. Stebbins to W .B. Van Duyn on November 15, 1994

Dear Bill:

A question has been recently raised regarding the applicability to BBA of a new source review (NSR) under the prevention of significant deterioration (PSD) program. The issue stems from the variability of sulfur concentration in the crude sulfate turpentine (CST) feedstock and the net long term trend toward increasing sulfur concentration. Much of the sulfur forms sulfur dioxide (SO_2) when process vapors, including total reduced sulfur (TRS) compounds, are burned in the boilers for air pollution control. This source of SO_2 emissions has traditionally not been recognized in air permits but may be recognized in upcoming Title V permits.

Any considerations of the applicability of a new source review (NSR) under the prevention of significant deterioration (PSD) rules, emerge from the designation of Duval County as "unclassifiable" for the pollutant sulfur dioxide, [62-275.420 (2)(a) F.A.C.] A PSD/NSR can "...apply only to any major stationery source or major modification that would be constructed in an area designated as attainment or *unclassifiable* under section 107(d)1)D or (E) of the [Clean Air] Act." [40 CFR 52.21(i)(3)] (emphasis added).

At BBA, the determination of PSD/NSR applicability hinges on whether or not the net escalation of sulfur concentration constitutes a "major modification" and the applicability of certain PSD relief mechanisms established by the Clean Air Act and subsequent rulemakings at both the federal and state levels.

The Clean Air Act clearly established the purpose of the PSD/NSR program to seek a balance between protection of public health and welfare and sustained economic growth [Section 160]. Congress provided for that balance by establishing certain exemptions from PSD applicability which were later clarified in federal and state rulemaking activities and a series of guidance documents.

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From our examination of the plant and the documents provided, we have concluded that PSD is not applicable. Our conclusion is readily supported by any and all of the following provisions:

- A change in sulfur concentration in the CST feedstock does not constitute a major modification.

- PSD does not apply because PSD regulations exempt from review the *use* of an alternate raw material (higher sulfur CST) if the source was capable of accommodating the raw material before January 6, 1975.

- An increase in sulfur dioxide emissions resulting from a switch from natural gas to other permitted fuels having higher sulfur content (i.e. fuel oil or terpene derivatives) is exempt from PSD determinations.

- BBA's vapor collection system, which complies with a government mandate to incinerate malodorous vapors including TRS, is environmentally beneficial and therefore not subject to PSD.

Although PSD/NSR does not apply, it is equally clear that the plant is prohibited from operating in a manner which contributes to an exceedance of ambient air quality standards. Consequently, we recommend taking action before submittal of the Title V air operation permit application package to the Florida Department of Environmental Protection (FDEP), to assure that there will be no conditions which will lead to an exceedance of ambient air quality standards before the expiration of the first Title V permit. We further recommend advising FDEP that we have considered their draft "Guidance on Actions For Title V Permitting Preparation," issued by Howard L. Rhodes, Director-Division of Air Resources Management (DARM) on September 9, 1994 and find no unpermitted sources subject to PSD. In the event that the FDEP views differ from ours, it will be far less costly to resolve the differences before entering into the Title V permitting process.

Before acting on these recommendations we request that you confirm our conclusions with competent environmental counsel, especially trained and experienced in air quality matters.

Thank you for the opportunity to investigate this matter. If you have any questions regarding the details please give me a call at 904/363-9999.

Very truly yours,

RUST Environment & Infrastructure, Inc.

Lloyd H. Stebbins, P.E., DEE

cc John Baggett
Roger Chubin
Alan Cawrse
Dennis Meany

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PREVENTION OF SIGNIFICANT DETERIORATION

APPLICABILITY CONSIDERATIONS

PROMPTED BY

INCREASED SULFUR DIOXIDE EMISSIONS

RESULTING FROM

ESCALATING SULFUR CONCENTRATIONS IN CRUDE SULFATE TURPENTINE

INTRODUCTION

As a consequence of emissions control developments, the kraft pulp and paper mills have progressively retained increasing amounts of total reduced sulfurs (TRS) in crude sulfate turpentine byproduct which becomes the principle feedstock for Bush Boake Allen. The sulfur in the CST is removed in the first processing step as TRS vapors which are ducted to the boilers for incineration. Certain turpentine derivatives which retain a small amount of sulfur are also occasionally burned as fuel. In either case, the sulfur becomes sulfur dioxide upon combustion.

A question has been recently raised regarding the applicability to BBA of a new source review (NSR) under the prevention of significant deterioration (PSD) program. The issue stems from the variability of sulfur concentration in the crude sulfate turpentine (CST) feedstock and the net long term trend toward increasing sulfur concentration. Much of the sulfur forms sulfur dioxide (SO_2) when turpentine derivatives and process vapors, including total reduced sulfur (TRS) compounds, are burned in the boilers.

Any considerations of PSD applicability emerge from the designation of Duval County as "unclassifiable" for the pollutant sulfur dioxide, [62-275.420 (2)(a)]. A PSD/NSR can "...apply only to any major stationary source or major modification that would be constructed in an area designated as attainment or *unclassifiable* under section 107(d)1)D or (E) of the [Clean Air] Act." [40 CFR 52.21(i)(3)] (emphasis added).

At BBA, a PSD/NSR could only apply if a net significant increase in the emission of sulfur dioxide (SO_2) from the combustion of sulfur in the CST is construed to be "major modification" of a stationary source. 40 CFR 52.21(b)(2)(i) defines "major modification" to include "... any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant... "

Several provisions of the Clean Air Act, subsequent rulemakings and guidance documents clearly demonstrate that BBA is not subject to PSD/NSR.

I. THE U.S. CONGRESS CLEARLY INTENDED TO SUPPORT REASONABLE ECONOMIC GROWTH WHILE PROTECTING PUBLIC HEALTH AND WELFARE.

The Clean Air Act (CAA) provides in Part C - Prevention of Significant Deterioration of Air Quality; Subpart I, that:

Section 160. The purposes of this part are as follows:

> **(1) to protect public health and welfare from any actual or potential adverse effect...from air pollution...notwithstanding attainment and maintenance of all national ambient air quality standards;**

And also

> **(3) to insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources....**

Clearly, the intent of the PSD program is to protect the public health and welfare while achieving a balance that will not inhibit reasonable economic growth. Consistent with that sense of purpose, there have emerged several exemptions and exclusions which have provided relief from the most burdensome elements of the PSD program for owners and operators of potentially affected facilities such as Bush Boake Allen. These exemptions and exclusions have been consistently manifested throughout statutory and regulatory language at federal, state and local levels.

II. A CHANGE IN SULFUR CONCENTRATION IN THE CST FEEDSTOCK DOES NOT CONSTITUTE A MAJOR MODIFICATION

Clearly, the change in sulfur concentration in the CST feedstock does not constitute a major modification. Such a conclusion was established as early as March 26, 1979 in an EPA letter from Edward E. Reich, Director-Division of Stationary Source Enforcement to Meyer Scolnick, Director-Enforcement Division, Region II. At issue was Consolidated Edison Company's proposed switch from 0.3% sulfur oil to 1.5% sulfur oil. Mr. Reich firmly stated that:

an increase in the sulfur content of a particular fuel burned at a source... is not considered a change in the method of operation; and therefore does not constitute a "major modification." I believe it has been the Agency's intent, since the development of the original PSD regulations, to exempt sulfur-in-fuel changes from preconstruction review. I refer you to 40 CFR §52.21(d)(1) [1977] which states:

"A source which is modified... to utilize an alternative fuel, or higher sulfur content fuel, shall not be subject to this paragraph..." The paragraph referred to is entitled "Review of New Sources". It is clear that under the old regulations, in effect prior to March 1, 1978, an increase in the sulfur content of oil did not bring a facility under PSD. I am not aware of any discussion in the amended PSD regulations or the preamble to the amended regulations which indicates a change in this policy. I believe an increase in the sulfur content of oil is beyond the scope of the preconstruction review requirements of the PSD regulations.

Current BBA operation permits prohibit burning of CST. The materials burned in the boilers are liquid and vapor derivatives of CST. Although CST is not burned, the amount of SO_2 formed from burning TRS-bearing turpentine derivatives is directly influenced by the concentration of sulfur in CST and the same determination applies.

III. PSD REGULATIONS EXEMPT FROM REVIEW THE *USE* OF AN ALTERNATE RAW MATERIAL (HIGHER SULFUR CST) IF THE SOURCE WAS CAPABLE OF ACCOMMODATING THE RAW MATERIAL BEFORE JANUARY 6, 1975.

In a separate ruling, dated July 13, 1981, Director Reich writing to W. Ray Cunningham, Chief-Air Media and Energy Branch, Region III reaffirmed that:

The PSD regulations [40 CFR 52.21(b)(2)(iii)(*e*)] exempt from review fuel switches or *use* of an alternate raw material if the source was capable of accommodating the fuel or raw material before January 6, 1975. This exemption is a result of the intent expressed by Congress that Section 169 of the Clean Air Act (Act) adopt to the extent possible, the same definition of "modification" used in Section 111 (a) of the Act (43 FR 26396).

The definition of "modification", which is included in regulations promulgated pursuant to Section III of the Act, provides an exemption for the use of an alternate fuel or raw material if the facility was designed to accommodate the alternate use (40 CFR 60.14(e)(d)). This section goes on to state that: "A facility shall be considered to be designed to accommodate an alternate fuel or raw material if that use could be accomplished under the facility's construction specifications as amended prior to the change".

The ruling considered Ashland Chemical's proposed switch from benzene to butane feedstock at their maleic anhydride plant in Neal, West Virginia. The determination that the feedstock switch did not constitute a modification and did not trigger PSD was rendered with the concurrence of the Office of General Counsel and the Office of Air Quality Planning and Standards despite anticipated collateral increases of 2500 tons VOC emissions per year at the Ashland facility. Similarly, the usage of a higher sulfur raw material (CST feedstock) at BBA is also exempted from PSD/NSR because its *use* could be accomplished under the facility's construction specifications prior to the change.

IV. THE CLEAN AIR ACT PROVIDES PSD RELIEF FOR EMISSIONS FROM FUEL SWITCHING THAT IS RESPONSIVE TO GOVERNMENT MANDATES.

Relief for actions responsive to government mandates is illustrated by fuel switching resulting from government orders emanating from the federal energy policy, which might otherwise trigger a PSD/NSR process. The Clean Air Act provides for state compliance orders and PSD rulemaking in Sec. 163(c)(1)(A),(B) and (D):

...any state which has a plan approved by the Administrator...may... issue orders or promulgate rules providing that...the following concentrations of such pollutants shall not be taken into account:

A) concentrations of such pollutant attributable to the increase of emissions from stationery sources which have converted from the use of petroleum products or natural gas...by reason of an order which is in effect under the provisions of Sec. 2(a) and (b) of the Energy Supply and Environmental Coordination Act of 1974...

and

B) the concentration of such pollutant attributable to the increase in emissions from stationery sources which have converted from using natural gas by reason of a natural gas curtailment... pursuant to the Federal Power Act...

Virtually identical language appears in Sec. 111(a)(8) as exclusions from the NSPS definition of "modification" and in the EPA rules [40 CFR 52.21(b)2(iii)(*b*)] as an exclusion from the PSD definition of "major modification." Elsewhere, the same exclusions apply to calculations of PSD increment consumption [40 CFR 52.21(f)(1)(i),(ii) and (iv)]. Florida rules [62-212.400(2)(c) F.A.C.] provide similar language to identify "modifications" which are not subject to new source review (NSR) requirements under the PSD process.

At BBA, turpentine derivatives are burned to balance inventory. Alternatively, turpentine derivatives can be burned for a short time to assure continuous operations in the event of a natural gas curtailment. Permit No. AO16-197534 also authorizes burning low sulfur fuel oil as an alternate boiler fuel. Since the federal energy policy establishes a higher priority for residential heating, a natural gas curtailment is typically triggered by cold weather extremes in northern states. Since such a curtailment is responsive to the Federal Power Act, the sulfur dioxide emissions resulting from the potential interim usage of the fuel oil or interim burning of turpentine

derivatives must not be included in a consideration of PSD applicability thresholds. In the event of a natural gas curtailment, an emergency supply or fuel oil would have to be found to avoid excessive combustion of valuable turpentine derivatives.

V. THE CLEAN AIR ACT PROVIDES PSD RELIEF FOR GOOD FAITH ACTIVITIES THAT SUPPORT THE INTENT AND PURPOSES OF THE ACT.

The principle of providing relief for an owner's good faith efforts to achieve the purposes of the Clean Air Act is illustrated by provisions for developing innovative technology and by exclusions for certain pollution control projects.

A. Innovative Technologies May Be Excluded From the Definition of "Major Modification."

Relief for innovative techniques is illustrated by excluding clean coal technologies from the definition of "major modification" [40 CFR 52.21(b)(2)(iii)(*i*)and (*j*)] and other special provisions for innovative control technologies [40 CFR 52.21 (v)]. Although BBA makes no assertions regarding innovative technologies, the concept is cited simply as an illustration of relief provided for efforts to support the intent and purposes of the Act.

B. Environmentally Beneficial Pollution Control Projects Are Excluded from the PSD Definition of "Major Modification" and the NSPS Definition of "Modification."

The EPA has provided relief for certain pollution control projects by excluding such projects from the PSD definition of "major modification" [40 CFR 52.21 (b)(2)(iii)(*h*)]:

"The addition, replacement or use of a pollution control project at an existing electric utility steam generating unit..."

Similar language excludes pollution control projects from the NSPS definition of modification [40 CFR 60.14(e)(5)]:

The addition or use of any system or device whose primary function is the reduction of air pollutants, except when an emission control system is removed or is replaced by a system which the Administrator determines to be less environmentally beneficial.

The exclusion in the PSD rules was originally granted to electrical utility steam generating units as a result of the WEPCO rulemaking [57 FR 32314]. The WEPCO rule, which resulted from a lengthy and controversial legal challenge, Wisconsin Electric Power Co. v. Reilly, 893 F.2d 901(7th cir. 1990), simply codified EPA's long standing policy of excluding certain pollution control projects from the NSR requirements of the PSD rule. Previously, NSR relief had been granted on a case-by-case basis. At the time of the WEPCO rulemaking, EPA indicated that it would subsequently consider adopting a formal pollution control project exclusion for other source categories [57 FR 32332].

Interim guidance was published on July 1, 1994 in a memorandum from John S. Seitz, Director-Office of Air Quality Planning and Standards to a distribution of regional EPA directors. On July 11, 1994, EPA distributed a preliminary staff working draft of a rule for "New Source Review Reform." Although the reader is cautioned that the staff working draft does not represent official EPA policy, it does footnote the Seitz memorandum and provide that, "Until final promulgation of today's proposed rules, EPA's current guidance on the treatment of certain types of projects

(involving source categories other than utilities) that may qualify on a case-by-case basis for an exclusion from major NSR as pollution control projects will remain in effect unchanged [Sec.III E-pg. 58]. The Seitz memorandum establishes that:

> **A pollution control project must be, on balance, "environmentally beneficial" to be eligible for an exclusion. Further, an environmentally-beneficial pollution control project may be excluded from otherwise applicable major NSR requirements only under conditions that ensure that the project will not cause or contribute to a violation of a national ambient air quality standard (NAAQS), prevention of significant deterioration (PSD) increment, or adversely affect visibility or other air quality related value (AQRV).**

The guidance provides two substantive safeguards to assure that air quality concerns with these projects are adequately addressed:

> **First, the permitting authority must determine that the proposed pollution control project, after consideration of the reduction in the targeted pollutant and any collateral effects, will be environmentally beneficial. ...in addition to this "environmentally-beneficial" standard, the permitting authority must ensure that adverse collateral environmental impacts from the project are identified, minimized, and, where appropriate, mitigated.**

According to John S. Seitz, "In the WEPCO rulemaking, EPA found that both add on emission control projects and fuel switches to less-polluting fuels could considered to be pollution control projects. For the purposes of... guidance, EPA affirms that these types of projects are appropriate candidates for a case-by-case exclusion as well. These types of projects include...thermal incinerators."

VI. THE BBA VAPOR COLLECTION SYSTEM USING EXISTING BOILERS FOR INCINERATION OF TRS IS CLEARLY ENVIRONMENTALLY BENEFICIAL.

At BBA, a costly vapor collection system was installed to collect malodorous total reduced sulfur (TRS) compounds and duct them to the boilers for incineration.

A. The Vapor Collection System Complies With A Jacksonville Environmental Protection Board Mandate.

The vapor collection system is required for compliance with Jacksonville Environmental Protection Board Rule 5, "Control of TRS and VOC Emissions From Crude Sulfate Turpentine Processing Facilities." Para. 5.201(c)(1) and (2) for stripping and fractionation columns provides that:

> **All vapors and organic liquid waste streams from CST stripping columns shall be captured and thermally oxidized.**

and

> **Overhead gases from fractionation columns processing regulated substances shall be captured and thermally oxidized.**

The local program mandate clearly demonstrates the environmentally beneficial nature of the pollution control project.

B. EPA Ruled That Incineration Of TRS Compounds In Steam Generating Units Is Environmentally Beneficial.

The EPA further affirmed that incineration of TRS compounds in steam generating units (boilers) is environmentally beneficial in Subpart Db-Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units [40 CFR 60.40b(f)] providing that:

> **Any change to an existing steam generating unit for the sole purpose of combusting gases containing TRS as defined under §60.281 is not considered a modification under §60.14 and the steam generating unit is not subject to this subpart.**

Although the boilers at BBA are below the Subpart Db threshold, the principle clearly applies.

C. FDER Ruled That Incineration of TRS Compounds in Steam Generating Unit is Environmentally Beneficial

At the state level, the Florida Department of Environmental Regulation (FDER) again reaffirmed the environmentally beneficial nature of TRS incineration in guidance issued as the, "Kraft Pulp Mill TRS Rule Implementation Handbook," published by the FDER in March 1986. The manual provides that:

> **Sulfur dioxide emission increases resulting from the incineration of TRS gas do not trigger PSD review. But such increases in emissions count against PSD increments and must not cause a violation of ambient standards. Source owners will be required as a part of each construction permit application to provide atmospheric dispersion modeling results for such emission increases to show whether increments or standards will be violated. If they are not violated, no SO_2 control will be required.**

In the same document, the FDER further responded to the question, "Will the state of Florida treat the increased SO_2 emissions generated when TRS gases are incinerated in a power boiler as

a modification subject to PSD review?":

> **An increase in actual SO_2 emissions from any of the sources used to incinerate TRS gases will not subject the facility to formal PSD review. The EPA has determined that an emissions increase resulting from an environmentally beneficial change in control technology is not a modification under NSPS and, therefore, should not be treated as a modification under PSD.**
>
> **Each company which plans to incinerate TRS gases will, however, be required to determine the expected increase in emissions of each criteria pollutant, the ambient air quality impact, and PSD increment consumption. Though a BACT determination will not be required, the department will require each company, as a minimum, to limit emissions to those levels necessary to comply with available PSD increments and ambient air quality standards. If the increase in these emissions do not result in modeled ambient concentrations exceeding the ambient standard or available PSD increment, the actual maximum expected increase in the emissions will become the allowable increase.**

Although the manual was written for kraft pulp and paper mills, the principle applies at least as well, or even more so, to crude sulfate turpentine processing facilities where the SO_2 emissions are at least an order of magnitude less than emissions from pulp and paper mills.

VII. PSD RULES DO NOT APPLY AT BBA. A NEW SOURCE REVIEW IS NOT REQUIRED.

The intent of the U.S. Congress to balance environmental protection and reasonable economic growth is clearly expressed by the relief mechanisms developed to protect certain owner's and operators from the most burdensome aspects of PSD/NSR. Bush Boake Allen qualifies for that protection.

Although a PSD permit is not required, the interim guidance by John S. Seitz clarified that such projects must not cause or contribute to a violation of a national ambient air quality standard (NAAQS), prevention of significant deterioration (PSD) increment, or adversely affect visibility or other air quality related value (AQRV).

In a clear ruling, the EPA established that a change in the sulfur concentration of a "fuel", in this case turpentine derivatives, does not constitute a major modification.

Similarly the *use* of an alternate raw material (higher sulfur CST) is exempted from PSD regulations because the BBA facility was capable of accommodating all forms of CST prior to January 6, 1975.

Sulfur dioxide emissions resulting from the combustion of fuel oil or turpentine derivatives in response to a government mandate to curtail natural gas usage are exempt from PSD determinations.

BBA's vapor collection system, which compiles with a government mandate to incinerate malodorous vapors including TRS, is environmentally beneficial and therefore not subject to PSD.

In summary, all of these considerations lead to the inescapable conclusion that PSD/NSR does not apply at Bush Boake Allen Inc.

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ENVIRONMENT & HEALTH

July 14, 1994

To: AF&PA Air Quality Committee

From: Rob Kaufmann

Subject: NSR Pollution Control Project Exclusion

Attached for your review is the long-awaited interim guidance from EPA on how state and local permitting authorities should determine whether proposed pollution control projects should be excluded from otherwise applicable NSR requirements. In the WEPCo rulemaking, EPA granted a blanket NSR exclusion for utility pollution control projects, but said that other industry projects could be excluded on a case-by-case basis. No guidance was provided to assist states in making these case-by-case decisions. We sued, claiming that EPA's rationale for not granting this exclusion to a wider industry audience was arbitrary and capricious. This litigation continues in effect. The attached guidance will ultimately be superseded by a formal rulemaking expanding the WEPCo exclusion, due to be proposed next year and promulgated in 1996.

While the attached guidance is welcome, it is still available only on a case-by-case basis; proposed exclusions must meet an "environmentally-beneficial" test, taking into account both emission decreases and collateral emission increases; collateral emission increases must be "minimized, and where appropriate, mitigated"; it does not address cross-media implementation projects; proposed projects must not result in violations of NAAQS, PSD increments, air quality-related values, or SIP conditions; and the application for the exclusion will be open to public review and comment. From a procedural standpoint, preparation and review of the application is likely to be burdensome.

We will discuss this guidance document and its implications at the July 22 Air Committee meeting.

RCK/ms
Attachment

copy - W. V/Doyle
J. Lawrence

info on "envir. benefic" exclusion to NSR...

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7/20/94

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

JUL 1 1994

MEMORANDUM

SUBJECT: Pollution Control Projects and New Source Review (NSR) Applicability

FROM: John S. Seitz, Director
Office of Air Quality Planning and Standards (MD-10)

TO: Director, Air, Pesticides and Toxics Management Division, Regions I and IV
Director, Air and Waste Management Division, Region II
Director, Air, Radiation and Toxics Division, Region III
Director, Air and Radiation Division, Region V
Director, Air, Pesticides and Toxics Division, Region VI
Director, Air and Toxics Division, Regions VII, VIII, IX and X

This memorandum and attachment address issues involving the Environmental Protection Agency's (EPA's) NSR rules and guidance concerning the exclusion from major NSR of pollution control projects at existing sources. The attachment provides a full discussion of the issues and this policy, including illustrative examples.

For several years, EPA has had a policy of excluding certain pollution control projects from the NSR requirements of parts C and D of title I of the Clean Air Act (Act) on a case-by-case basis. In 1992, EPA adopted an explicit pollution control project exclusion for electric utility generating units [see 57 FR 32314 (the "WEPCO rule" or the "WEPCO rulemaking")]. At the time, EPA indicated that it would, in a subsequent rulemaking, consider adopting a formal pollution control project exclusion for other source categories [see 57 FR 32332]. In the interim, EPA stated that individual pollution control projects

involving source categories other than utilities could continue to be excluded from NSR by permitting authorities on a case-by-case basis [see 57 FR at 32320]. At this time, EPA expects to complete a rulemaking on a pollution control project exclusion for other source categories in early 1996. This memorandum and attachment provide interim guidance for permitting authorities on the approvability of these projects pending EPA's final action on a formal regulatory exclusion.

The attachment to this memorandum outlines in greater detail the type of projects that may qualify for a conditional exclusion from NSR as a pollution control project, the safeguards that are to be met, and the procedural steps that permitting authorities should follow in issuing an exclusion. Projects that do not meet these safeguards and procedural steps do not qualify for an exclusion from NSR under this policy. Pollution control projects potentially eligible for an exclusion (provided all applicable safeguards are met) include the installation of conventional or innovative emissions control equipment and projects undertaken to accommodate switching to an inherently less-polluting fuel, such as natural gas. Under this guidance, States may also exclude as pollution control projects some material and process changes (e.g., the switch to a less polluting coating, solvent, or refrigerant) and some other types of pollution prevention projects undertaken to reduce emissions of air pollutants subject to regulation under the Act.

The replacement of an existing emissions unit with a newer or different one (albeit more efficient and less polluting) or the reconstruction of an existing emissions unit does not qualify as a pollution control project. Furthermore, this guidance only applies to physical or operational changes whose primary function is the reduction of air pollutants subject to regulation under the Act at existing major sources. This policy does not apply to air pollution controls and emissions associated with a proposed new source. Similarly, the fabrication, manufacture or production of pollution control/prevention equipment and inherently less-polluting fuels or raw materials are not pollution control projects under this policy (e.g., a physical or operational change for the purpose of producing reformulated gasoline at a refinery is not a pollution control project).

It is EPA's experience that many bona fide pollution control projects are not subject to major NSR requirements for the simple reason that they result in a reduction in annual emissions at the source. In this way, these pollution control projects are outside major NSR coverage in accordance with the general rules for determining applicability of NSR to modifications at existing sources. However, some pollution control projects could result in significant potential or actual increases of some pollutants. These latter projects comprise the subcategory of pollution control projects that can benefit from this guidance.

A pollution control project must be, on balance, "environmentally beneficial" to be eligible for an exclusion. Further, an environmentally-beneficial pollution control project may be excluded from otherwise applicable major NSR requirements only under conditions that ensure that the project will not cause or contribute to a violation of a national ambient air quality standard (NAAQS), prevention of significant deterioration (PSD) increment, or adversely affect visibility or other air quality related value (AQRV). In order to assure that air quality concerns with these projects are adequately addressed, there are two substantive and two procedural safeguards which are to be followed by permitting authorities reviewing projects proposed for exclusion.

First, the permitting authority must determine that the proposed pollution control project, after consideration of the reduction in the targeted pollutant and any collateral effects, will be environmentally beneficial. Second, nothing in this guidance authorizes any pollution control project which would cause or contribute to a violation of a NAAQS, or PSD increment, or adversely impact an AQRV in a class I area. Consequently, in addition to this "environmentally-beneficial" standard, the permitting authority must ensure that adverse collateral environmental impacts from the project are identified, minimized, and, where appropriate, mitigated. For example, the source or the State must secure offsetting reductions in the case of a project which will result in a significant increase in a nonattainment pollutant. Where a significant collateral increase in actual emissions is expected to result from a pollution control project, the permitting authority must also assess whether the increase could adversely affect any national ambient air quality standard, PSD increment, or class I AQRV.

In addition to these substantive safeguards, EPA is specifying two procedural safeguards which are to be followed. First, since the exclusion under this interim guidance is only available on a case-by-case basis, sources seeking exclusion from major NSR requirements prior to the forthcoming EPA rulemaking on a pollution control project exclusion must, before beginning construction, obtain a determination by the permitting authority that a proposed project qualifies for an exclusion from major NSR requirements as a pollution control project. Second, in considering this request, the permitting authority must afford the public an opportunity to review and comment on the source's application for this exclusion. It is also important to note that any project excluded from major new source review as a pollution control project must still comply with all otherwise applicable requirements under the Act and the State implementation plan (SIP), including minor source permitting.

This guidance document does not supersede existing Federal or State regulations or approved SIP's. The policies set out in this memorandum and attachment are intended as guidance to be applied only prospectively (including those projects currently under evaluation for an exclusion) during the interim period until EPA takes action to revise its NSR rules, and do not represent final Agency action. This policy statement is not ripe for judicial review. Moreover, it is not intended, nor can it be relied upon, to create any rights enforceable by any party in litigation with the United States. Agency officials may decide to follow the guidance provided in this memorandum, or to act at variance with the guidance, based on an analysis of specific circumstances. The EPA also may change this guidance at any time without public notice. The EPA presently intends to address the matters discussed in this document in a forthcoming NSR rulemaking regarding proposed changes to the program resulting from the NSR Reform process and will take comment on these matters as part of that rulemaking.

As noted above, a detailed discussion of the types of projects potentially eligible for an exclusion from major NSR as a pollution control project, as well as the safeguards such projects must meet to qualify for the exclusion, is contained in the attachment to this memorandum. The Regional Offices should send this memorandum with the attachment to States within their jurisdiction. Questions concerning specific issues and cases should be directed to the appropriate EPA Regional Office. Regional Office staff may contact David Solomon, Chief, New Source Review Section, at (919) 541-5375, if they have any questions.

Attachment

cc: Air Branch Chief, Regions I-X
NSR Reform Subcommittee Members

Attachment

GUIDANCE ON EXCLUDING POLLUTION CONTROL PROJECTS FROM MAJOR NEW SOURCE REVIEW (NSR)

I. Purpose

The Environmental Protection Agency (EPA) presently expects to complete a rulemaking on an exclusion from major NSR for pollution control projects by early 1996. In the interim, certain types of projects (involving source categories other than utilities) may qualify on a case-by-case basis for an exclusion from major NSR as pollution control projects. Prior to EPA's final action on a regulatory exclusion, this attachment provides interim guidance for permitting authorities on the types of projects that may qualify on a case-by-case basis from major NSR as pollution control projects, including the substantive and procedural safeguards which apply.

II. Background

The NSR provisions of part C [prevention of significant deterioration (PSD)] and part D (nonattainment requirements) of title I of the Clean Air Act (Act) apply to both the construction of major new sources and the modification of existing major sources.[1] The modification provisions of the NSR programs in parts C and D are based on the broad definition of modification in section 111(a)(4) of the Act. That section contemplates a two-step test for determining whether activities at an existing major facility constitute a modification subject to new source requirements. In the first step, the reviewing authority determines whether a physical or operational change will occur. In the second step, the question is whether the physical or operational change will result in any increase in emissions of any regulated pollutant.

The definition of physical or operational change in section 111(a)(4) could, standing alone, encompass the most mundane activities at an industrial facility (even the repair or replacement of a single leaky pipe, or a insignificant change in the way that pipe is utilized). However, EPA has recognized that Congress did not intend to make every activity at a source subject to new source requirements under parts C and D. As a result, EPA has by regulation limited the reach of the modification provisions of parts C and D to only major modifications. Under NSR, a "major modification" is generally a physical change or change in the method of operation of a major stationary source which would result in a significant net emissions increase in the emissions of any regulated pollutant

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[1]The EPA's NSR regulations for nonattainment areas are set forth at 40 CFR 51.165, 52.24 and part 51, Appendix S. The PSD program is set forth in 40 CFR 52.21 and 51.166.

[see, e.g., 40 CFR 52.21(b)(2)(i)]. A "net emissions increase" is defined as the increase in "actual emissions" from the particular physical or operational change together with any other contemporaneous increases or decreases in actual emissions [see, e.g., 40 CFR 52.21(b)(3)(i)]. In order to trigger major new source review, the net emissions increase must exceed specified "significance" levels [see, e.g., 40 CFR 52.21(b)(2)(i) and 40 CFR 52.21(b)(23)]. The EPA has also adopted common-sense exclusions from the "physical or operational change" component of the definition of "major modification." For example, EPA's regulations contain exclusions for routine maintenance, repair, and replacement; for certain increases in the hours of operation or in the production rate; and for certain types of fuel switches [see, e.g., 40 CFR 52.21(b)(2)(iii)].

In the 1992 "WEPCO" rulemaking [57 FR 32314], EPA amended its PSD and nonattainment NSR regulations as they pertain to utilities by adding certain pollution control projects to the list of activities excluded from the definition of physical or operational changes. In taking that action, EPA stated it was largely formalizing an existing policy under which it had been excluding individual pollution control projects where it was found that the project "would be environmentally beneficial, taking into account ambient air quality" [57 FR at 32320; see also id., n. 15].[2]

The EPA has provided exclusions for pollution control projects in the form of "no action assurances" prior to November 15, 1990 and nonapplicability determinations based on Act changes as of November 15, 1990 (1990 Amendments). Generally, these exclusions addressed clean coal technology projects and fuel switches at electric utilities.

Because the WEPCO rulemaking was directed at the utility industry which faced "massive industry-wide undertakings of pollution control projects" to comply with the acid rain provisions of the Act [57 FR 32314], EPA limited the types of projects eligible for the exclusion to add-on controls and fuel switches at utilities. Thus, pollution control projects under the WEPCO rule are defined as:

> any activity or project undertaken at an existing electric utility steam generating unit for purposes of reducing emissions from such unit. Such activities or projects are limited to:

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[2]This guidance pertains only to source categories other than electric utilities, and EPA does not intend for this guidance to affect the WEPCO rulemaking in any way.

> (A) The installation of conventional or innovative pollution control technology, including but not limited to advanced flue gas desulfurization, sorbent injection for sulfur dioxide (SO_2) and nitrogen oxides (NO_x) controls and electrostatic precipitators;
>
> (B) An activity or project to accommodate switching to a fuel which is less polluting than the fuel in use prior to the activity or project . . .

[40 CFR 51.165(a)(1)(xxv) (emphasis added)]. The definition also includes certain clean coal technology demonstration projects. Id.

The EPA built two safeguards into the exclusion in the rulemaking. First, a project that meets the definition of pollution control project will not qualify for the exclusion where the "reviewing authority determines that (the proposed project) renders the unit less environmentally beneficial . . ." [see, e.g., 51.165(a)(1)(v)(C)(8)]. In the WEPCO rule, EPA did not provide any specific definition of the environmentally-beneficial standard, although it did indicate that the pollution control project provision "provides for a case-by-case assessment of the pollution control project's net emissions and overall impact on the environment" [57 FR 32321]. This provision is buttressed by a second safeguard that directs permitting authorities to evaluate the air quality impacts of pollution control projects that could--through collateral emissions increases or changes in utilization patterns--adversely impact local air quality [see 57 FR 32322]. This provision generally authorizes, as appropriate, a permitting authority to require modelling of emissions increases associated with a pollution control project. Id. More fundamentally, it explicitly states that no pollution control project under any circumstances may cause or contribute to violation of a national ambient air quality standard (NAAQS), PSD increment, or air quality related value (AQRV) in a class I area. Id.[3]

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[3]The WEPCO rule refers specifically to "visibility limitation" rather than "air quality related values." However, EPA clearly stated in the preamble to the final rule that permitting agencies have the authority to "solicit the views of others in taking any other appropriate remedial steps deemed necessary to protect class I areas. . .. The EPA emphasizes that all environmental impacts, including those on class I areas, can be considered. . .." [57 FR 32322]. Further, the statutory protections in section 165(d) plainly are intended to protect against any "adverse impact on the AQRV of such [class I] lands

As noted, the WEPCO rulemaking was expressly limited to existing electric utility steam generating units [see, e.g., 40 CFR 51.165(a)(1)(v)(C)(8) and 51.165(a)(1)(xx)]. The EPA limited the rulemaking to utilities because of the impending acid rain requirements under title IV of the Act, EPA's extensive experience with new source applicability issues for electric utilities, the general similarity of equipment, and the public availability of utility operating projections. The EPA indicated it would consider adopting a formal NSR pollution control project exclusion for other source categories as part of a separate NSR rulemaking. The rulemaking in question is now expected to be finalized by early 1996. On the other hand, the WEPCO rulemaking also noted that EPA's existing policy was, and would continue to be, to allow permitting authorities to exclude pollution control projects in other source categories on a case-by-case basis.

III. Case-By-Case Pollution Control Project Determinations

The following sections describe the type of projects that may be considered by permitting authorities for exclusion from major NSR as pollution control projects and two safeguards that permitting authorities are to use in evaluating such projects--the environmentally-beneficial test and an air quality impact assessment. To a large extent, these requirements are drawn from the WEPCO rulemaking. However, because the WEPCO rule was designed for a single source category, electric utilities, it cannot and does not serve as a complete template for this guidance. Therefore, the following descriptions expand upon the WEPCO rule in the scope of qualifying projects and in the specific elements inherent in the safeguards. These changes reflect the far more complicated task of evaluating pollution control projects at a wide variety of sources facing a myriad of Federal, State, and local clean air requirements.

Since the safeguards are an integral component of the exclusion, States must have the authority to impose the safeguards in approving an exclusion from major NSR under this policy. Thus, State or local permitting authorities in order to use this policy should provide statements to EPA describing and affirming the basis for its authority to impose these safeguards absent major NSR. Sources that obtain exclusions from permitting authorities that have not provided this affirmation of authority are at risk in seeking to rely on the exclusion issued by the

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(including visibility)." Based on this statutory provision, EPA believes that the proper focus of any air quality assessment for a pollution control project should be on visibility and any other relevant AQRV's for any class I areas that may be affected by the proposed project. Permitting authorities should notify Federal Land Managers where appropriate concerning pollution control projects which may adversely affect AQRV's in class I areas.

permitting agency, because EPA may subsequently determine that the project does not qualify as a pollution control project under this policy.

A. Types of Projects Covered

1. Add-On Controls and Fuel Switches

In the WEPCO rulemaking, EPA found that both add-on emissions control projects and fuel switches to less-polluting fuels could be considered to be pollution control projects. For the purposes of today's guidance, EPA affirms that these types of projects are appropriate candidates for a case-by-case exclusion as well. These types of projects include:

- the installation of conventional and advanced flue gas desulfurization and sorbent injection for SO_2;
- electrostatic precipitators, baghouses, high efficiency multiclones, and scrubbers for particulate or other pollutants;
- flue gas recirculation, low-NO_x burners, selective non-catalytic reduction and selective catalytic reduction for NO_x; and
- regenerative thermal oxidizers (RTO), catalytic oxidizers, condensers, thermal incinerators, flares and carbon adsorbers for volatile organic compounds (VOC) and toxic air pollutants.

Projects undertaken to accommodate switching to an inherently less-polluting fuel such as natural gas can also qualify for the exclusion. Any activity that is necessary to accommodate switching to a inherently less-polluting fuel is considered to be part of the pollution control project. In some instances, where the emissions unit's capability would otherwise be impaired as a result of the fuel switch, this may involve certain necessary changes to the pollution generating equipment (e.g., boiler) in order to maintain the normal operating capability of the unit at the time of the project.

2. Pollution Prevention Projects

It is EPA's policy to promote pollution prevention approaches and to remove regulatory barriers to sources seeking to develop and implement pollution prevention solutions to the extent allowed under the Act. For this reason, permitting authorities may also apply this exclusion to switches to inherently less-polluting raw materials and processes and certain

other types of "pollution prevention" projects.[4] For instance, many VOC users will be making switches to water-based or powder-paint application systems as a strategy for meeting reasonably available control technology (RACT) or switching to a non-toxic VOC to comply with maximum achievable control technology (MACT) requirements.

Accordingly, under today's guidance, permitting authorities may consider excluding raw material substitutions, process changes and other pollution prevention strategies where the pollution control aspects of the project are clearly evident and will result in substantial emissions reductions per unit of output for one or more pollutants. In judging whether a pollution prevention project can be considered for exclusion as a pollution control project, permitting authorities may also consider as a relevant factor whether a project is being undertaken to bring a source into compliance with a MACT, RACT, or other Act requirement.

Although EPA is supportive of pollution control and prevention projects and strategies, special care must be taken in classifying a project as a pollution control project and in evaluating a project under a pollution control project exclusion. Virtually every modernization or upgrade project at an existing industrial facility which reduces inputs and lowers unit costs has the concurrent effect of lowering an emissions rate per unit of fuel, raw material or output. Nevertheless, it is clear that these major capital investments in industrial equipment are the very types of projects that Congress intended to address in the new source modification provisions [see Wisconsin Electric Power Co. v. Reilly, 893 F.2d 901, 907-10 (7th Cir. 1990) (rejecting contention that utility life extension project was not a physical or operational change); Puerto Rican Cement Co., Inc. v. EPA, 889 F.2d 292, 296-98 (1st Cir. 1989) (NSR applies to modernization project that decreases emissions per unit of output, but increases economic efficiency such that utilization may increase and result in net increase in actual emissions)]. Likewise, the replacement of an existing emissions unit with a newer or different one (albeit more efficient and less polluting) or the

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[4]For purposes of this guidance, pollution prevention means any activity that through process changes, product reformulation or redesign, or substitution of less polluting raw materials, eliminates or reduces the release of air pollutants and other pollutants to the environment (including fugitive emissions) prior to recycling, treatment, or disposal; it does not mean recycling (other than certain "in-process recycling" practices), energy recovery, treatment, or disposal [see Pollution Prevention Act of 1990 section 6602(b) and section 6603(5)(A) and (B); see also "EPA Definition of 'Pollution Prevention,'" memorandum from F. Henry Habicht II, May 28, 1992].

reconstruction of an existing emissions unit would not qualify as a pollution control project. Adopting a policy that automatically excludes from NSR any project that, while lowering operating costs or improving performance, coincidentally lowers a unit's emissions rate, would improperly exclude almost all modifications to existing emissions units, including those that are likely to increase utilization and therefore result in overall higher levels of emissions.

In order to limit this exclusion to the subset of pollution prevention projects that will in fact lower annual emissions at a source, permitting authorities should not exclude as pollution control projects any pollution prevention project that can be reasonably expected to result in an increase in the utilization of the affected emissions unit(s). For example, projects which significantly increase capacity, decrease production costs, or improve product marketability can be expected to affect utilization patterns. With these changes, the environment may or may not see a reduction in overall source emissions; it depends on the source's operations after the change, which cannot be predicted with any certainty.[5] This is not to say that these types of projects are necessarily subject to major NSR requirements, only that they should not be excluded as pollution control projects under this guidance. The EPA may consider different approaches to excluding pollution prevention projects from major NSR requirements in the upcoming NSR rulemaking. Under this guidance, however, permitting authorities should carefully review proposed pollution prevention projects to evaluate whether utilization of the source will increase as a result of the project.

Furthermore, permitting authorities should have the authority to monitor utilization of an affected emissions unit or source for a reasonable period of time subsequent to the project to verify what effect, if any, the project has on utilization. In cases where the project has clearly caused an increase in utilization, the permitting authority may need to reevaluate the basis for the original exclusion to verify that an exclusion is still appropriate and to ensure that all applicable safeguards are being met.

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[5]This is in marked contrast to the addition of pollution control equipment which typically does not, in EPA's experience, result in any increase in the source's utilization of the emission unit in question. In the few instances where this presumption is not true, the safeguards discussed in the next section should provide adequate environmental protections for these additions of pollution control equipment.

B. Safeguards

The following safeguards are necessary to assure that projects being considered for an exclusion qualify as environmentally beneficial pollution control projects and do not have air quality impacts which would preclude the exclusion. Consequently, a project that does not meet these safeguards does not qualify for an exclusion under this policy.

1. Environmentally-Beneficial Test

Projects that meet the definition of a pollution control project outlined above may nonetheless cause collateral emissions increases or have other adverse impacts. For instance, a large VOC incinerator, while substantially eliminating VOC emissions, may generate sizeable NO_x emissions well in excess of significance levels. To protect against these sorts of problems, EPA in the WEPCO rule provided for an assessment of the overall environmental impact of a project and the specific impact, if any, on air quality. The EPA believes that this safeguard is appropriate in this policy as well.

Unless information regarding a specific case indicates otherwise, the types of pollution control projects listed in III. A. 1. above can be presumed, by their nature, to be environmentally beneficial. This presumption arises from EPA's experience that historically these are the very types of pollution controls applied to new and modified emissions units. The presumption does not apply, however, where there is reason to believe that 1) the controls will not be designed, operated or maintained in a manner consistent with standard and reasonable practices; or 2) collateral emissions increases have not been adequately addressed as discussed below.

In making a determination as to whether a project is environmentally beneficial, the permitting authority must consider the types and quantity of air pollutants emitted before and after the project, as well as other relevant environmental factors. While because of the case-by-case nature of projects it is not possible to list all factors which should be considered in any particular case, several concerns can be noted.

First, pollution control projects which result in an increase in non-targeted pollutants should be reviewed to determine that the collateral increase has been minimized and will not result in environmental harm. Minimization here does not mean that the permitting agency should conduct a BACT-type review or necessarily prescribe add-on control equipment to treat the collateral increase. Rather, minimization means that, within the physical configuration and operational standards usually associated with such a control device or strategy, the

source has taken reasonable measures to keep any collateral increase to a minimum. For instance, the permitting authority could require that a low-NO_x burner project be subject to temperature and other appropriate combustion standards so that carbon monoxide (CO) emissions are kept to a minimum, but would not review the project for a CO catalyst or other add-on type options. In addition, a State's RACT or MACT rule may have explicitly considered measures for minimizing a collateral increase for a class or category of pollution control projects and requires a standard of best practices to minimize such collateral increases. In such cases, the need to minimize collateral increase from the covered class or category of pollution control projects can be presumed to have been adequately addressed in the rule.

In addition, a project which would result in an unacceptable increased risk due to the release of air toxics should not be considered environmentally beneficial. It is EPA's experience, however, that most projects undertaken to reduce emissions, especially add-on controls and fuel switches, result in concurrent reductions in air toxics. The EPA expects that many pollution control projects seeking an exclusion under this guidance will be for the purpose of complying with MACT requirements for reductions in air toxics. Consequently, unless there is reason to believe otherwise, permitting agencies may presume that such projects by their nature will result in reduced risks from air toxics.

2. Additional Air Quality Impacts Assessments

(a) General

Nothing in the Act or EPA's implementing regulations would allow a permitting authority to approve a pollution control project resulting in an emissions increase that would cause or contribute to a violation of a NAAQS or PSD increment, or adversely impact visibility or other AQRV in a class I area [see, e.g., Act sections 110(a)(2)(C), 165, 169A(b), 173]. Accordingly, this guidance is not intended to allow any project to violate any of these air quality standards.

As discussed above, it is possible that a pollution control project--either through an increase in an emissions rate of a collateral pollutant or through a change in utilization--will cause an increase in actual emissions, which in turn could cause or contribute to a violation of a NAAQS or increment or adversely impact AQRV's. For this reason, in the WEPCO rule the EPA required sources to address whenever 1) the proposed change would result in a significant net increase in actual emissions of any criteria pollutant over levels used for that source in the most recent air quality impact analysis; and 2) the permitting

authority has reason to believe that such an increase would cause or contribute to a violation of a NAAQS, increment or visibility limitation. If an air quality impact analysis indicates that the increase in emissions will cause or contribute to a violation of any ambient standard, PSD increment, or AQRV, the pollution control exclusion does not apply.

The EPA believes that this safeguard needs to be applied here as well. Thus, where a pollution control project will result in a significant increase in emissions and that increased level has not been previously analyzed for its air quality impact and raises the possibility of a NAAQS, increment, or AQRV violation, the permitting authority is to require the source to provide an air quality analysis sufficient to demonstrate the impact of the project. The EPA will not necessarily require that the increase be modeled, but the source must provide sufficient data to satisfy the permitting authority that the new levels of emissions will not cause a NAAQS or increment violation and will not adversely impact the AQRV's of nearby potentially affected class I areas.

In the case of nonattainment areas, the State or the source must provide offsetting emissions reductions for any significant increase in a nonattainment pollutant from the pollution control project. In other words, if a significant collateral increase of a nonattainment pollutant resulting from a pollution control project is not offset on at least a one-to-one ratio then the pollution control project would not qualify as environmentally beneficial.[6] However, rather than having to apply offsets on a case-by-case basis, States may consider adopting (as part of their attainment plans) specific control measures or strategies for the purpose of generating offsets to mitigate the projected collateral emissions increases from a class or category of pollution control projects.

(b) Determination of Increase in Emissions

The question of whether a proposed project will result in an emissions increase over pre-modification levels of actual emissions is both complicated and contentious. It is a question that has been debated by the New Source Review Reform Subcommittee of the Clean Air Act Advisory Committee and is expected to be revisited by EPA in the same upcoming rulemaking that will consider adopting a pollution control project exclusion. In the interim, EPA is adopting a simplified approach

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[6]Regardless of the severity of the classification of the nonattainment area, a one-to-one offset ratio will be considered sufficient under this policy to mitigate a collateral increase from a pollution control project. States may, however, require offset ratios that are greater than one-to-one.

to determining whether a pollution control project will result in increased emissions.

The approach in this policy is premised on the fact that EPA does not expect the vast majority of these pollution control projects to change established utilization patterns at the source. As discussed in the previous section, it is EPA's experience that add-on controls do not impact utilization, and pollution prevention projects that could increase utilization may not be excluded under this guidance. Therefore, in most cases it will be very easy to calculate the emissions after the change: the product of the new emissions rate times the existing utilization rate. In the case of a pollution control project that collaterally increases a non-targeted pollutant, the actual increase (calculated using the new emissions rate and current utilization pattern) would need to be analyzed to determine its air quality impact.

The permitting authority may presume that projects meeting the definition outlined in section III(A)(1) will not change utilization patterns. However, the permitting authority is to reject this presumption where there is reason to believe that the project will result in debottlenecking, loadshifting to take advantage of the control equipment, or other meaningful increase in the use of the unit above current levels. Where the project will increase utilization and emissions, the associated emissions increases are calculated based on the post-modification potential to emit of the unit considering the application of the proposed controls. In such cases the permitting agency should consider the projected increase in emissions as collateral to the project and determine whether, notwithstanding the emissions increases, the project is still environmentally beneficial and meets all applicable safeguards.

In certain limited circumstances, a permitting agency may take action to impose federally-enforceable limits on the magnitude of a projected collateral emissions increase to ensure that all safeguards are met. For example, where the data used to assess a projected collateral emissions increase is questionable and there is reason to believe that emissions in excess of the projected increase would violate an applicable air quality standard or significantly exceed the quantity of offsets provided, restrictions on the magnitude of the collateral increase may be necessary to ensure compliance with the applicable safeguards.

IV. Procedural Safeguards

Because EPA has not yet promulgated regulations governing a generally applicable pollution control project exclusion from major NSR (other than for electric utilities), permitting authorities must consider and approve requests for an exclusion

on a case-by-case basis, and the exclusion is not self-executing. Instead, sources must receive case-by-case approval from the permitting authority pursuant to a minor NSR permitting process, State nonapplicability determination or similar process. [Nothing in this guidance voids or creates an exclusion from any applicable minor source preconstruction review requirement in any SIP that has been approved pursuant to section 110(a)(2)(C) and 40 CFR 51.160-164.] This process should also provide that the application for the exclusion and the permitting agency's proposed decision thereon be subject to public notice and the opportunity for public and EPA written comment. In those limited cases where the applicable SIP already exempts a class or category of pollution controls project from the minor source permitting public notice and comment requirements, and where no collateral increases are expected (e.g., the installation of a baghouse) and all otherwise applicable environmental safeguards are complied with, public notice and comment need not be provided for such projects. However, even in such circumstances, the permitting agency should provide advance notice to EPA when it applies this policy to provide an exclusion. For standard-wide applications to groups of sources (e.g., RACT or MACT), the notice may be provided to EPA at the time the permitting authority intends to issue a pollution control exclusion for the class or category of sources and thereafter notice need not be given to EPA on an individual basis for sources within the noticed group.

V. Emission Reduction Credits

In general, certain pollution control projects which have been approved for an exclusion from major NSR may result in emission reductions which can serve as NSR offsets or netting credits. All or part of the emission reductions equal to the difference between the pre-modification actual and post-modification potential emissions for the decreased pollutant may serve as credits provided that 1) the project will not result in a significant collateral increase in actual emissions of any criteria pollutant, 2) the project is still considered environmentally beneficial, and 3) all otherwise applicable criteria for the crediting of such reductions are met (e.g., quantifiable, surplus, permanent, and enforceable). Where an excluded pollution control project results in a significant collateral increase of a criteria pollutant, emissions reduction credits from the pollution control project for the controlled pollutant may still be granted provided, in addition to 2) and 3) above, the actual collateral increase is reduced below the applicable significance level, either through contemporaneous reductions at the source or external offsets. However, neither the exclusion from major NSR nor any credit (full or partial) for emission reductions should be granted by the permitting authority where the type or amount of the emissions increase which would result from the use of such credits would lessen the

environmental benefit associated with the pollution control project to the point where the project would not have initially qualified for an exclusion.

IV. Illustrative Examples

The following examples illustrate some of the guiding principles and safeguards discussed above in reviewing proposed pollution control projects for an exclusion from major NSR.

Example 1

PROJECT DESCRIPTION: A chemical manufacturing facility in an attainment area for all pollutants is proposing to install a RTO to reduce VOC emissions (including emissions of some hazardous pollutants) at the plant by about 3000 tons per year (tpy). The emissions reductions from the RTO are currently voluntary, but may be necessary in the future for title III MACT compliance. Although the RTO has been designed to minimize NO_x emissions, it will produce 200 tpy of new NO_x emissions due to the unique composition of the emissions stream. There is no information about the project to rebut a presumption that the project will not change utilization of the source. Aside from the NO_x increase there are no other environmental impacts known to be associated with the project.

EVALUATION: As a qualifying add-on control device, the project may be considered a pollution control project and may be considered for an exclusion. The permitting agency should: 1) verify that the NO_x increase has been minimized to the extent practicable, 2) confirm (through modeling or other appropriate means) that the actual significant increase in NO_x emissions does not violate the applicable NAAQS,[7] PSD increment, or adversely impact any Class I area AQRV, and 3) apply all otherwise applicable SIP and minor source permitting requirements, including opportunity for public notice and comment.

Example 2

PROJECT DESCRIPTION: A source proposes to replace an existing coal-fired boiler with a gas-fired turbine as part of a cogeneration project. The new turbine is an exact replacement for the energy needs supplied by the existing boiler and will emit less of each pollutant on an hourly basis than the boiler did.

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[7]If the source were located in an area in which nonattainment NSR applied to NO_x emissions increases, 200 tons of NO_x offset credits would be required for the project to be eligible for an exclusion.

EVALUATION: The replacement of an existing emissions unit with a new unit (albeit more efficient and less polluting) does not qualify for an exclusion as a pollution control project. The company can, however, use any otherwise applicable netting credits from the removal of the existing boiler to seek to net the new unit out of major NSR.

Example 3

PROJECT DESCRIPTION: A source plans to physically renovate and upgrade an existing process line by making certain changes to the existing process, including extensive modifications to emissions units. Following the changes, the source will expand production and manufacture and market a new product line. The project will cause an increase in the economic efficiency of the line. The renovated line will also be less polluting on a per-product basis than the original configuration.

EVALUATION: The change is not eligible for an exclusion as a pollution control project. On balance, the project does not have clearly evident pollution control aspects, and the resultant decrease in the per-product emissions rate (or factor) is incidental to the project. The project is a physical change or change in the method of operation that will increase efficiency and productivity.

Example 4

PROJECT DESCRIPTION: In response to the phaseout of chlorofluorocarbons (CFC) under title VI of the Act, a major source is proposing to substitute a less ozone-depleting substance (e.g., HCFC-141b) for one it currently uses that has a greater ozone depleting potential (e.g., CFC-11). A larger amount of the less-ozone depleting substance will have to be used. No other changes are proposed.

EVALUATION: The project may be considered a pollution control project and may be considered for an exclusion. The permitting agency should verify that 1) actual annual emissions of HCFC-141b after the proposed switch will cause less stratospheric ozone depletion than current annual emissions of CFC-11; 2) the proposed switch will not change utilization patterns or increase emissions of any other pollutant which would impact a NAAQS, PSD increment, or AQRV and will not cause any cross-media harm, including any unacceptable increased risk associated with toxic air pollutants; and 3) apply all otherwise applicable SIP and minor source permitting requirements, including opportunity for public notice and comment.

Example 5

PROJECT DESCRIPTION: An existing landfill proposes to install either flares or energy recovery equipment [i.e., turbines or internal combustion (IC) engines]. The reductions from the project are estimated at over 1000 tpy of VOC and are currently not necessary to meet Act requirements, but may be necessary some time in the future. In case A the project is the replacement of an existing flare or energy system and no increase in NO_x emissions will occur. In case B, the equipment is a first time installation and will result in a 100 tpy increase in NO_x. In case C, the equipment is an addition to existing equipment which will accommodate additional landfill gas (resulting from increased gas generation and/or capture consistent with the current permitted limits for growth at the landfill) and will result in a 50 tpy increase in NO_x.

EVALUATION: Projects A, B, and C may be considered pollution control projects and may be considered for an exclusion; however, in cases B and C, if the landfill is located in an area required to satisfy nonattainment NSR for NO_x emissions, the source would be required to obtain NO_x offsets at a ratio of at least 1:1 for the project to be considered for an exclusion. [NOTE: VOC-NO_x netting and trading for NSR purposes may be discussed in the upcoming NSR rulemaking, but it is beyond the scope of this guidance.] Although neither turbines or IC engines are listed in section III.A.1 as add-on control devices and would normally not be considered pollution control projects, in this specific application they serve the same function as a flare, namely to reduce VOC emissions at the landfill with the added incidental benefit of producing useful energy in the process.[8]

The permitting agency should: 1) verify that the NO_x increase has been minimized to the extent practicable; 2) confirm (through modeling or other appropriate means) that the actual significant increase in NO_x emissions will not violate the

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[8]The production of energy here is incidental to the project and is not a factor in qualifying the project for an exclusion as a pollution control project. In addition, any supplemental or co-firing of non-landfill gas fuels (e.g., natural gas, oil) would disqualify the project from being considered a pollution control project. The fuels would be used to maximize any economic benefit from the project and not for the purpose of pollution control at the landfill. However, the use of an alternative fuel solely as a backup fuel to be used only during brief and infrequent start-up or emergency situations would not necessarily disqualify an energy recovery project from being considered a pollution control project.

applicable NAAQS, PSD increment, or adversely impact any AQRV; and 3) apply all otherwise applicable SIP and minor source and, as noted above, in cases B and C ensures that NO_x offsets are provided in an area in which nonattainment review applies to NO_x emissions increases. permitting requirements, including opportunity for public notice and comment.

The August 1994 DEP addendum reflects the use of an Empirical Kinetic Modeling Approach (EKMA) to evaluate the impact of a predicted small increase of NO_x emissions in the Jacksonville area. The EKMA data indicated that the expected 7.5% increase in NO_x emissions will not significantly affect maximum ozone concentrations. The simultaneous decrease in VOC emissions will reduce the impact of the NO_x emissions and, furthermore, NO_x emissions might be less than projected due to decreases in the emissions from non-road diesel engines under Title IV of the Clean Air Act Amendments.

According to DEP officials, EPA recently approved the Jacksonville area maintenance plan. Final notice should be published in the Federal Register before the end of the year.

Note: DEP recently applied for redesignation and submitted a maintenance plan for the **Broward/Dade/Palm Beach** area. EPA approval is expected by the end of the year.

REVISIONS TO THE F.A.C. 62-200 SERIES (Formerly 17-200)

On October 11, 1994, a Hearing was held to adopt DEP's proposed revisions, and several industry amendments, to the Florida Administrative Code 62-200 Series. DEP formally proposed these revisions in the September 9, 1994, *Florida Administrative Weekly (FAW)*, after conducting two workshops and incorporating various industry comments. The majority of the revisions were of a corrective nature. Numerous other changes, however, were more substantive. These include:

- changing the word "source" to "emissions unit," and adding a new definition for "emissions unit;"
- adding a temporary exemption from permitting and enforcement for certain previously unpermitted emission units;
- incorporating specific provisions from the WEPCO decision, which includes an exemption from preconstruction review requirements for pollution control projects;
- adding a new Chapter 62-204, which adopts the Florida State Implementation Plan and General Conformity provisions;
- allowing collectively-regulated emission units to be described in one section of a Title V application, instead of requiring each unit in the collection to be described separately;
- incorporating a statutory exemption for Title V permit holders from construction permit fees for modifications that are not subject to PSD or nonattainment-area preconstruction review;
- adding procedures for a federally enforceable non-Title V permit, which will allow some sources to opt-out of Title V by classifying themselves as synthetic non-Title V sources; and

4.8
4.9 (OUTDATED)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 26 1979

OFFICE OF ENFORCEMENT

MEMORANDUM

SUBJECT: Applicability of PSD to the Consolidated Edison Company

FROM: Director
Division of Stationary Source Enforcement

TO: Meyer Scolnick, Director
Enforcement Division - Region II

This is in response to your memo of February 15, 1979, requesting a determination as to whether the Consolidated Edison Company's proposed switch from .3% sulfur oil to 1.5% sulfur oil constitutes a "major modification" for purposes of PSD.

As discussed below, an increase in the sulfur content of a particular fuel burned at a source does not constitute use of an "alternative" fuel; is not considered a change in the method of operation; and therefore does not constitute a major modification.

I believe it has been the Agency's intent, since the development of the original PSD regulations, to exempt sulfur-in-fuel changes from preconstruction review. I refer you to 40 CFR §52.21(d)(1) [1977] which states,

"...A source which is modified, but does not increase the amount of sulfur oxides or particulate matter emitted, or is modified to utilize an alternative fuel, or higher sulfur content fuel, shall not be subject to this paragraph..." The paragraph referred to is entitled "Review of New Sources". It is clear that under the old regulations, in effect prior to March 1, 1978, an increase in the sulfur content of oil did not bring a facility under PSD. I am not aware of any discussion in the amended PSD regulations or the preamble to the amended regulations which indicates a change in this policy. I believe an increase in the sulfur content of oil is beyond the scope of the preconstruction review

To W. B. VanDuyn

4 pgs.

Fr: JE Commerson

requirements of the PSD regulations.

As I'm sure you are aware, any SIP relaxation that would affect a PSD area must include a determination that the applicable increment will not be exceeded. The amount of increment that will be consumed by a SIP relaxation is determined by modeling the difference between the allowable emissions resulting from the new relaxed SIP limit and the source's baseline emissions level.

Should the State of New York decide to relax its sulfur-in-fuel regulations applicable to Con Ed, a demonstration must be made that the PSD increments will not be exceeded. In this way, protection of the increments will be accomplished.

Should you have any further questions on this issue, please contact Libby Scopino at 755-2564.

Edward E. Reich

cc: Darryl Tyler, CPDD
Jerry Ostrov, OGC
Stu Roth, Region II

Best Available Copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

4.18

JUL 13 1981

MEMORANDUM

SUBJECT: PSD Applicability for Ashland Chemical's Maleic Anhydride Plant in Neal, West Virginia

FROM: Director
Division of Stationary Source Enforcement

TO: W. Ray Cunningham, Chief
Air Media and Energy Branch, Region III

In a memo dated May 27, 1981, you requested a determination from this Office regarding the applicability of PSD review for a switch in feedstock materials at Ashland Chemical's maleic anhydride plant in Neal, West Virginia. Ashland proposes to change its feedstock from benzene to butane, which will eliminate benzene emissions but will increase VOC emissions by approximately 2500 tons per year. It is then necessary to determine if this increase in emissions is subject to PSD review.

The PSD regulations (40 CFR 52.21(b)(2)(iii)(e)) exempt from review fuel switches or use of an alternate raw material if the source was capable of accommodating the fuel or material before January 6, 1975. This exemption is a result of the intent expressed by Congress that Section 169 of the Clean Air Act (Act) adopt to the extent possible, the same definition of "modification" used in Section 111(a) of the Act (43 FR 26396).

The definition of "modification" , which is included in regulations promulgated pursuant to Section 111 of the Act, provides an exemption for the use of an alternate fuel or raw material if the facility was designed to accommodate the alternate use (40 CFR 60.14(e)(4)). This section goes on to state that: "A facility shall be considered to be designed to accommodate an alternate fuel or raw material if that use could be accomplished under the facility's construction specifications as amended prior to the change".

Information from Ashland Chemical indicates that the facility was originally designed to use either benzene or butane. Contracts for the construction of the facility, which included dual feedstock capability, were signed in May 1974. Thus, it appears that the facility was capable of accommodating butane as an alternate feedstock before January 6, 1975 and the proposed switch to butane will not be subject to PSD review.

CONCURRENCES

SYMBOL	EN-341	EN-341							
SURNAME	Arello	Kimdl	Rasm	Kurt					
DATE	7/10/81	7/10/81	7-10-81	7/13/81					

EPA Form 1320-1 (12-70)

OFFICIAL FILE COPY

This determination was made with the concurrence of the Office of General Counsel and the Office of Air Quality Planning and Standards. If you have any questions regarding this determination, please contact Janet Farella of my staff at 755-2564.

Edward E. Reich

cc: Peter Wyckoff, OGC
Mike Trutna, OAQPS

December 2, 1994

EPA To Propose Amendments To Clean Air Act New Source Review Program

EPA expects to submit amendments to the Clean Air Act's major New Source Review ("NSR") program to the Office of Management and Budget early this month. The NSR program provides for preconstruction review and permitting of new or modified major stationary sources of air pollutants. A staff draft of the amendments has been critiqued by EPA's Clean Air Act Advisory Committee and is being revised in accordance with the comments received from the committee. EPA expects the proposed rule to be published for public comment in February 1995.

According to EPA officials, the proposed rule will address four major areas: 1) the applicability of the major NSR program; 2) best available control technology ("BACT") and lowest achievable emission rate ("LAER") requirements; 3) Class I areas; and 4) prevention of significant deterioration ("PSD") area preconstruction monitoring.

The proposed rule would clarify and/or modify the circumstances under which the NSR program would apply to a stationary source. It would:

- revise the baseline used to determine whether a physical or operational change results in a significant increase in emissions;
- simplify the modification test used for emissions units that have recently undergone a BACT/LAER or similar technology review;
- exclude certain pollution control projects from the definition of "major modification" under both the PSD and nonattainment NSR rules; and
- allow states to issue source-specific plant-wide applicability limits ("PALs"). Once a PAL is established for a source, the source could make physical or operational changes without becoming subject to NSR, provided that the source's total emissions remain under the PAL limit.

The proposed rule attempts to significantly reduce the burden involved in determining what technology meets the BACT/LAER requirements. This portion of the proposed rule would:

- improve the content and management of the Reasonably Available Control Technology ("RACT") Clearinghouse;
- limit the sources of information that must be considered when investigating new technologies;
- authorize states to establish a cut-off point during the permit process after which consideration of additional control technologies would be required only in specific situations; and
- revise the innovative control technology waiver and apply it in both the PSD and nonattainment NSR programs.

For major sources located within 200 kilometers of a Class I (pristine) area, the proposed rule would mandate improved coordination between the permit applicant, the permitting authority, and federal land managers.

Finally, the proposed rule seeks public comment on the appropriateness of exempting sources from PSD preconstruction monitoring under certain circumstances.

If you have any questions or would like further information on the proposed NSR rule, please call Marilyn Kuray at (202) 626-5409.

In March 1986, the FDER published a document entitled, "Kraft Pulp Mill TRS Rule - Implementation Handbook." Of particular interest, is a section of that document entitled, "Sulfur Dioxide Emission Increases," which reads:

> Sulfur dioxide emission increases resulting from the incineration of the TRS gas do not trigger PSD review. But such increases in emissions count against PSD increments and must not cause a violation of ambient standards. Source owners will be required as a part of each construction permit application to provide atmospheric dispersion modeling results for such emission increases to show whether increments or standards will be violated. If they are not violated, no SO_2 control will be required.

Exhibit #4 - Excerpt from TRS Rule

exhibit #5.

RESULTS

FROM

AMBIENT AIR QUALITY MODELING CONDUCTED BY THE CITY OF JAX

FOR

BBA AND ALL OTHER SURROUNDING SOURCES

IN THE JACKSONVILLE AREA.

(NOTE: IT IS OUR UNDERSTANDING THAT THESE RESULTS INCLUDE THE BACKGROUND CONCENTRATIONS.)

REGULATORY & ENVIRONMENTAL
SERVICES DEPARTMENT

FAX COVER SHEET

Exhibit 5
Air
Modeling
Results
to check
Compliance
with AAQ standards.

AIR QUALITY DIVISION

421 West Church Street, Suite 412
Jacksonville, Florida 32202
(904)630-3484 (OFFICE)
(904)630-3638 (FAX)

DATE: 5/4/95 TIME: 9:35 am

TO: Suresh Chandrani FAX #: (407) 331-0025
RUST

MESSAGE: Enclosed are projected concentrations for BBA Scenario 6.

FROM: Lori Tilley

NUMBER OF PAGES FAXED (including cover): _____

PLEASE CALL (904)630-3484 IF YOU DO NOT RECEIVE ALL THE PAGES OF THIS FAX OR IF TRANSMISSION IS UNCLEAR. OUR FAX NUMBER IS (904)630-3638.

RUST ENVIRONMENT & INFRASTRUCTURE

Fax Transmittal

Date: 5/2/95

Time: 2:25 pm.

To: Lori Tilley

Company: RESD, Air Quality Division

City/State: TAX, FL

Fax Number: 904-630-3638

From: Suresh Chandhani

Job/Project No: BBA SO2 Modeling (SPECIAL REQUEST)

Total Pages Including This Page: 1

Comments: Dear Lori,

BBA Management has changed their worst case scenario for SO_2 emissions, to project a realistic emissions cap for their Title V permit. This scenario will be good until 2003.

You are requested to perform air modeling for one more scenario: 3337 TPY total emission rate, 250 TPY from Boiler #2 & 3087 TPY from Boiler #3; Stack height = 93 feet, Stack diameter = 3 feet, stack velocity = 20.86 meters/sec., UTM coordinates & temp. are same as earlier scenarios. Please Label this as Scenario # 6.

For Originator:

Return Original ☐ Yes ☐ No ☐ Pickup

For Operator:

Date Sent _____ Time Thanks, By Suresh Chandhani P.E, CHMM.

P.S. can we in Orlando office on Thursday if you have any questions. Ph # 407-331-5967

In case of transmission problems, please call: 407-331-5967

870 S. North Lake Boulevard Suite 1028 • Altamonte Springs, FL 32701 • (407) 331-5967 • Fax: (407) 331-0025

BUSH BOAKE ALLEN ISCST2 MODELING
SULFUR DIOXIDE

BBA ONLY:	3 HR.	24 HR.	ANNUAL
Scenario 1	455.69	164.77	9.99
Scenario 4	456.62	154.80	9.58
Scenario 5	295.30	106.78	6.47
Scenario 6	483.08	168.87	11.67

BBA AND ALL SO_2 EMITTING SOURCES:

	3 HR.	24 HR.	ANNUAL
Scenario 1	527.69	202.59	21.86
Scenario 4	573.49	190.56	21.55
Scenario 5	410.18	164.22	18.34
Scenario 6	529.93	207.38	23.92

Note: Concentrations are in ug/m^3

RUST ENVIRONMENT & INFRASTRUCTURE

MEMORANDUM

TO: Lori Tilley
Associate Engineer
City of Jacksonville, RESD
VIA FAX No.: 904-630-3638

FROM: Suresh Chandnani
Phone No. 407/331-5967 (Orlando office)
FAX No. 407/331-0025 (Orlando office)

DATE: April 19, 1995

SUBJ: SO_2 Modeling for BBA
Rust Project No. 87534.110

of pages = 4

BBA has authorized Rust Environment & Infrastructure to provide this data to RESD for SO_2 modeling and determining the impact caused by increased SO_2 emissions on meeting the ambient air quality standards for SO_2.

Realistically, BBA would like to know the impact for five operating scenarios as defined in Table I. The outputs (results) from the modeling conducted by RESD will allow BBA to strategically choose their options as far as managing SO_2 emissions is concerned.

Table 1 - List of Scenarios

Scenario No.	Description	Boiler #2 Emission Rate, TPY	Boiler #3 Emission Rate, TPY	Total Emissions Rate, TPY	Stack Height Feet	Stack Diameter Feet
1	TRS + Natural Gas	0	1704	1704	67'3"	4'
2	TRS + Natural Gas	0	740	740	67'3"	4'
3	#6 Fuel Oil (S=0.7%)	250	249	499	67'3"	4'
4	TRS + #6 fuel oil	250	1953	2203	76'	3' → 4'
5	TRS + Natural Gas	0	1103	1103	67'3"	4'
6	TRS + # fuel oil	250	3087	3337	93	4'

Notes: (1) Assume SO_2 emissions due to TRS are from Boiler #3 only (worst case)
(2) Delete incinerator emission source

Table 2 - Stack Parameters for BBA Boilers 2 & 3

Source #	Source Description	Scenario #	x m.	y m.	Velocity m/sec	Temp °K	SO_2 Emission Rate gm/sec
1	Boiler #2	1	427.885	3357.635	11.73	586	0
2	Boiler #3	1	427.892	3357.630	11.73	586	49.04
1	Boiler #2	2	427.885	3357.635	11.73	586	0
2	Boiler #3	2	427.892	3357.630	11.73	586	21.32
1	Boiler #2	3	427.885	3357.635	11.73	586	7.19
2	Boiler #3	3	427.892	3357.630	11.73	586	7.164
1	Boiler #2	4	427.885	3357.635	20.86	586	7.19
2	Boiler #3	4	427.892	3357.630	20.86	586	56.21
1	Boiler #2	5	427.885	3357.635	11.73	586	0
2	Boiler #3	5	427.892	3357.630	11.73	586	31.78

Notes: (1) Distance between two boiler stacks is approximately 7.7 meters
(2) Assume boiler stacks have no restrictions at the outlet, vertical exhaust for both stacks.

Buiding Dimensions

At BBA

Boiler House

height= 7.92 m, length = 28.96 m, width = 12.19 m

Gum plant

height= 11.28 m, length = 30.48m, width = 18.29 m

BUSH BOAKE ALLEN ISCST2 MODELING
SULFUR DIOXIDE

BBA ONLY:	3 HR.	24 HR.	ANNUAL
Scenario 1	455.69	164.77	9.99
Scenario 4	456.62	154.80	9.58
Scenario 5	295.30	106.78	6.47

BBA AND ALL SO_2 EMITTING SOURCES:

	3 HR.	24 HR.	ANNUAL
Scenario 1	527.69	202.59	21.86
Scenario 4	573.49	190.56	21.55
Scenario 5	410.18	164.22	18.34

ANHEUSER BUSCH

source #	source description	x (utm coordinates)	y (utm coordinates)	stack height (meters)	diameter (meters)	velocity (meters/sec)	temperature (kelvin)	building dimensions height (meters)	building dimensions max. width (meters)	emission rate (grams/sec)
1	boiler #1	438010	3366790	30.5	1.07	17.4	483	28.65	67.97	15.2481
2	boiler #2	438010	3366790	30.5	1.07	17.4	483	"	"	15.2481
3	boiler #3	438010	3366790	30.5	1.07	17.4	483	"	"	15.2481
4	boiler #4	438010	3366790	30.5	1.07	17.4	483	"	"	6.47325

Emission rates were calculated for fuel oil use with a 1.5% sulfur content.

8.6 meters apart

28.2 feet.

U.S. GYPSUM

source #	source description	emission rate	x	y	height	temp.	exit velocity	diameter	building h	building l	building w
1	4 paper mill boilers	.00955	438913	3360906	18.29	533	3.35	0.914	13.11	54.90	18.30
2	cal. kettle #7	.00213	438900	3361200	24.38	478	3.23	1.219	6.98	103.63	36.83
3	cal. kettles #1-6	.00075	438900	3361200	28.19	505	0.98	1.067	6.98	103.63	36.83
4	board kiln #2	.00420	438900	3361200	13.72	422	29.05	1.067	6.98	103.63	36.83
5	rotary rock dryer	3.88395	43890	3361200	26.82	339	16.82	0.472	6.98	103.63	36.83
6	dowtherm heater	1.15483	438900	3361200	20.73	644	6.61	0.914	6.98	103.63	36.83
7	no.3 board line kiln	.00912	43890	3361200	28.96	369	1.52	2.042	6.98	103.63	36.83
8	no.1 board line kiln	.00288	43890	3361200	9.14	444	13.63	0.953	6.98	103.63	36.83
	no.1 board line wet center	.00288	43890	3361200	11.74	377	13.20	0.953	"	"	"
10	no.1 board line dry end	.0028	43890	3361200	9.45	430	10.97	0.953	"	"	"

Emission rates for all sources were calculated using natural gas except #6 fuel oil with a 1.5% sulfur content was used for the rotary rock dryer

JEA SOUTHSIDE

source #	source description	emission rate	x (utm coordinates)	y (utm coordinates)	height (meters)	temp. (K)	exit velocity (meters/sec)	diameter (meters)	building h (meters)	building l (meters)	building w (meters)
1	boiler #3	79.85114	437678	3353933	40.69	424	14.3256	3.048	25.0	152.4	38.1
2	boiler #4	110.33583	437670	3353962	43.74	408	11.8872	3.253	25.0	152.4	38.1
3	boiler #5A	105.54275	437682	3353849	44.20	415	16.7640	3.048	25.0	152.4	38.1
4	boiler #5B	105.54275	437682	3353841	44.20	415	16.7640	3.048	25.0	152.4	38.1
5	aux. Boiler #1	1.31565	437640	3353820	9.14	505	11.2776	0.610	25.0	152.4	38.1

Emission rates were calculated for boilers 3, 4, & 5 using #6 fuel oil with a 1.0% sulfur content and #2 fuel oil with a 0.5% sulfur content for auxiliary boilers.

JEFFERSON SMURFIT

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	#10 bark/coal boiler	439500	3359100	60.9	3.05	10.7	355	48.5	24.9	34.3980
2	#3 lime kiln	439800	3359400	64.0	1.37	11.0	346	0	0	1.3119
3	recovery boiler	439800	3359400	53.3	3.2	22.9	410	32.0	28.4	21.6063

Emission rates were calculated using #6 fuel oil with 2.5% sulfur content for the #9 smelt dissolving tank, #3 lime kiln, and the recove boiler. #6 fuel oil with a 1.0% sulfur content was used for the #10 bark/coal boiler.

UNION CAMP CORPORATION

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	boiler #2	427650	3357350	15.6	1.22	11.7	586	7.37	28.65	7.5608
2	boiler #3	427650	3357350	15.6	1.22	11.6	586	7.37	28.65	7.1637
~~3~~	~~incinerator~~	427650	3357350	16.1	1.07	7.32	700	7.37	28.65	5.7503

Emission rates for all sources were calculated using fuel oil with a sulfur content of 0.7%.

711

gm/sec. tpy

120 μg/m³

711 x 3
= 21

9340 → 0.108 lb/sec
12070 → 0.1397 lb/sec

lb = 454 gm

JEA KENNEDY

source #	source	emission	x	y	height	temp.	exit	diameter	building		
1	boiler #8	74.9801	440065	3359150	45.72	394	10.668	3.200	22.6	98.8	24.4
2	boiler #9	74.9801	440070	3359130	45.72	398	10.363	3.200	22.6	98.8	24.4
3	boiler #10A	92.5243	440080	3359150	41.45	411	13.716	2.743	22.6	98.8	24.4
4	boiler #10B	92.5243	440080	3359150	41.45	411	13.716	2.743	22.6	98.8	24.4
5	comb. turbine #3	46.8778	439775	3359160	13.7	714	8.8	5.84	0	0	0
6	comb. turbine #4	46.8778	439830	3359175	13.7	714	8.8	5.84	0	0	0
7	comb. turbine #5	46.8778	439865	3359185	13.7	714	8.8	5.84	0	0	0
8	comb. turbine #6	46.8778	439905	3359175	13.7	714	8.8	5.84	0	0	0
9	aux. boiler	1.21985	440000	3359200	9.14	505	11.278	0.61	0	0	0

Emission rates were calculated using #6 fuel oil with a 1.0% sulfur content for boilers 8-10 and #2 fuel oil with a 0.5% content for all combustion turbines and auxiliary boilers.

CEDAR BAY COGENERATING FACILITY

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emi
1	3 CFB units	441610	3365540	122.68	4.04	32.45	403	49.07	108.83	74.74

ADDED 2/17/95

NAVAL AIR STATION JACKSONVILLE

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	power plant #1	435200	3343900	13.7	1.40	11.6	505	13.87	55.47	0.0164
2	power plant #2	434200	3343500	39.6	2.13	3.66	505	10.52	43.89	0.0176

Emission rates were calculated for both sources using #6 fuel oil with a 1.0% sulfur content.

NAVAL AIR STATION - CECIL FIELD

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	steam generator # 28	414986	3342943	13.1	1.16	7.93	505	10.67	37.19	1.1508
2	steam generator # 27	414986	3342943	13.1	1.16	7.93	505	10.67	37.19	1.1508
3	steam generator # 25	414700	3343700	13.7	1.07	10.36	505	10.67	37.19	0.0032

Emission rates for all three sources were calculated using #2 fuel oil with a 0.5% sulfur content.

NAVAL STATION NAYPORT

source #	source description	x (utm coordinates)	y (utm coordinates)	stack height (meters)	diameter (meters)	velocity (m/s)	temperature (degrees K)	building dimensions height (meters)	building dimensions max. width	emission rate (g/s)
1	boiler #1&2 bldg 250	460670	3361760	14.0	1.22	7.93	561	7.62	21.95	10.0919
2	boiler # 1,2,3 bldg 1241	460630	3361760	12.2	0.91	14.3	544	8.23	29.57	15.660

REVISED 2/16/95

This information was used as inputs to EPA's Industrial Source Complex Model (ISCST2).

Emission rates were calculated for all boilers using #2 fuel oil with a 1.0% sulfur content.

SCM GLIDCO ORGANICS

source #	source description	x (utm coordinates)	y (utm coordinates)	stack height (meters)	diameter (meters)	velocity (meters/sec)	temperature (kelvin)	building dimensions height (meters)	building dimensions max. width (meters)	emission rate (grams/se
1	boiler #4	435600	3360750	12.2	1.10	14.0	405	9.14	39.93	19.909
2	boiler #5	435600	3360750	15.2	1.10	12.8	536	9.14	39.93	20.945
3	boiler #6	435600	3360750	15.2	1.22	10.4	514	9.14	39.93	24.455
4	boiler #7	435600	3360750	13.7	1.22	5.49	450	9.14	39.93	4.0077

Emission rates were calculated using blend oil with a 1.5% sulfur content for all sources.

[illegible] (grams/sec)

FLORIDA STEEL CORPORATION

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	electric arc furnace	405070	3350020	15.2	3.05	17.1	353	28.4	125.9	1.9506
2	billet reheat furnace	405070	3350020	48.8	2.13	4.27	864	12.2	370.5	0.4546

Emission rates were calculated using #4 fuel oil with a 0.7% sulfur content.

SEMINOLE KRAFT CORPORATION

source #	source description	x (utm coordinates) (meters)	y (utm coordinates) (meters)	stack height (meters)	diameter (meters)	velocity (meters/sec)	temperature (K)	building dimensions height (meters)	building dimensions max. width (meters)	emission rate (grams/sec)
1	3 package boilers	441800	3365600	60.96	2.44	16.15	447	49.1	108.8	1.1795

REVISED 2/26/95

MODEL USED WAS EPA'S INDUSTRIAL SOURCE COMPLEX MODEL - SHORT TERM (ISCST2)

NOTE: emission rate is for SO2 only, in grams/second x & y are east and north UTM coordinates
stack height, diameter, building height, length and width are in meters temperature is in degrees Kelvin
exit velocity is in meters/second sources listed only include those that emit SO2

2 fuel oil 0.05 % sulfur content

JEA NORTHSIDE

source #	source description	x	y	stack height	diameter	velocity	temperature	building dimensions height	building dimensions max. width	emission rate
1	combustion turbine #3	446750	3365500	10.1	5.8	2.13	780	0	0	41.3448
2	combustion turbine #4	446750	3365500	10.1	5.8	2.13	780	0	0	41.3448
3	combustion turbine #5	446750	3365500	10.1	5.8	2.13	780	0	0	41.3448
4	combustion turbine #6	446750	3365500	10.1	5.8	2.13	780	0	0	1.8125
5	#1 steam generator	446940	3364995	76.2	5.03	19.8	401	31.7	176.8	690.38
6	#2 steam generator	446900	3364960	88.4	5.03	16.2	408	31.7	176.8	586.82
7	#3 steam generator	446820	3364975	106.7	7.01	18.1	439	31.7	176.8	1255.76
8	auxiliary boiler "a"	446900	3364800	73.2	5.03	1.22	672	0	0	0.5754

Emission rates were calculated using #2 fuel oil with a 0.5% sulfur content for all combustion turbines, #6 fuel oil with 1.8% fuel oil for all steam generators and #2 fuel oil with 1.8% sulfur content for auxiliary boilers.

JEA - ST. JOHN'S POWER PARK

source #	source description	x	y	stack height	diameter	velocity	temperature	building height	dimensions max. width	emission rate
1	steam generator #1	446900	3366300	195.1	6.80	22.0	353	81.2	32.0	588.41
2	steam generator #2	446900	3366300	195.1	6.80	24.7	353	81.2	32.0	588.41
3	auxiliary boiler	446900	3366300	81.7	1.76	15.5	449	81.2	32.0	25.60

Emission rates were calculated using coal for the steam generators and #2 fuel oil for the auxiliary boilers.

CELOTEX CORPORATION

source #	source description	x (utm coordinates)	y (utm coordinates)	stack height (meters)	diameter (meters)	velocity (meters/sec)	temperature (K)	building dimensions height (meters)	building dimensions max. width (meters)	emission rate (grams/se
1	wallboard drying kiln	446430	3362370	15.24	0.95	7.32	436	9.14	259.08	20.161
2	calcining kettle burner #1	446430	3362370	22.86	0.91	4.88	728	15.24	49.94	0.2764
3	calcining kettle burner #2	446430	3362370	22.86	0.91	4.88	728	15.24	49.94	0.2764
4	calcining kettle burner #3	446430	3362370	22.86	0.91	4.88	728	15.24	49.94	0.2764

Emission rates were calculated using #5 fuel oil with a sulfur content of 1.8%.

MODEL USED WAS EPA'S INDUSTRIAL SOURCE COMPLEX MODEL - SHORT TERM (ISCST2)

Exhibit 6

AIR DISPERSION MODELING ANALYSIS

BUSH BOAKE ALLEN INC.

JACKSONVILLE, FLORIDA

JUNE 1995

PREPARED BY

RUST ENVIRONMENT & INFRASTRUCTURE INC.

GREENVILLE, SOUTH CAROLINA

JOB NUMBER 87534.104

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A. Introduction

The following air dispersion modeling analysis was prepared by RUST Environment & Infrastructure Inc. (RUST E&I) for the Bush Boake Allen Inc. (BBA) facility in Jacksonville, Florida. The analysis was conducted for the pollutant sulfur dioxide (SO_2) for the two boilers at the facility.

B. Emissions Inventory and Stack Parameters

The emission rates and stack parameters used in the modeling analysis were provided by BBA and are presented in Table 1 (the Tables and Figures are in numerical order following the text). There were six modeling scenarios evaluated in this analysis. The six scenarios are a result of firing natural gas or No. 6 oil in both boilers, in combination with incinerating various amounts of total reduced sulfur (TRS) vapor released during processing of crude sulfate turpentine (CST).

Scenario 1 is the currently permitted emission rate of 499 TPY. This emission rate represents firing No. 6 oil in both boilers, and does not include any emissions resulting from TRS incineration.

Scenario 2 is the actual emission rate of 740 TPY contained in the *1994 Annual Air Operating Report.*. This emission rate represents firing natural gas in both boilers, and includes emissions of 740 TPY resulting from actual TRS incineration in 1994.

Scenario 3 is the maximum emission rate of 1,103 TPY based on the 1994 processing rates and the daily upper-end of the normal range of TRS concentration in the CST. This emission rate represents firing natural gas in both boilers, and includes emissions of 1,103 TPY resulting from maximum TRS incineration.

Scenario 4 is a projected emission rate of 1,704 TPY based on a hypothetical TRS concentration in the CST of 15,000 ppm. This emission rate represents firing natural gas in both boilers, and includes emissions of 1,704 TPY resulting from projected TRS incineration.

Scenario 5 is a projected emission rate of 2,203 TPY based on a hypothetical TRS concentration in the CST of 15,000 ppm. This emission rate represents the permitted emissions of 499 TPY from firing No. 6 oil in both boilers, and includes emissions of 1,704 TPY resulting from projected TRS incineration.

Scenario 6 is a projected emission rate of 3,337 TPY based on a future expected TRS concentration in the CST of 25,000 ppm. This emission rate represents the permitted emissions of 499 TPY from firing No. 6 oil in both boilers, and includes emissions of 2,838 TPY resulting from projected TRS incineration.

Modeling scenarios 1 through 4 were performed using the current stack heights of 67 feet above grade for both boilers. Scenario five assumed both boiler stacks are 79 feet above grade. Scenario 6 assumed both boiler stacks are the GEP formula height of 93 feet above grade (therefore no building downwash). Figure 1 shows the location of each of the modeled sources at the facility.

C. Good Engineering Practice (GEP) Stack Height Analysis

The proximity of a structure to an air emissions discharge point, such as a stack, determines whether the structure can affect the dispersion characteristics of the air emissions plume emitted from the discharge point. The ISCST2 model accounts for building-wake downwash effects for point sources by using the appropriate dimensions of an adjacent or nearby building in dispersion computations.

The building wake analysis was conducted following the procedures outlined in the U.S. EPA document *Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) Revised*, June 1985.

The facility plot plan is presented in Figure 1. A summary of the GEP height calculations for all major structures at the facility is presented in Table 2. All buildings greater than 25 feet high were considered major.

The structure which is the "controlling" building at the facility is the 37 foot high gum plant. The calculated GEP height for this building is 93 feet. The stack heights for the two boilers at the facility are 67 feet in modeling scenarios 1 through 4, and 79 feet in scenario 5. Therefore, building wake effects were included in the modeling analysis for scenarios 1 through 5. The building wake parameters used in the ISCST2 modeling analysis were based on the U.S. EPA BPIP model (version 95086).

A cavity impact analysis was also performed. The cavity extent zones for all major structures at the facility are presented in Table 3. The cavity extent zones of the major buildings at the facility

do not extend beyond the nearest property boundary. Therefore, cavity impacts were not included in the modeling analysis.

D. Model Selection and Options

The U.S. EPA Industrial Source Complex Short-Term model, Version 2 (ISCST2), dated 93109, was used to predict 3-hour, 24-hour and annual impacts. This was accomplished by executing the ISCST2 model in the rural mode using "refined meteorology" provided by the Florida Department of Environmental Protection (Florida DEP). The ISCST2 model options selected were:

- Concentrations calculated in micrograms/cubic meter
- Terrain receptor elevations read
- Input data listed
- Rural option
- Default wind speed categories
- Default emission rate conversion factor
- Default wind profile exponents
- Default vertical potential temperature gradients
- Final plume rise
- Stack tip downwash
- Buoyancy Induced Dispersion
- Building wake downwash effects

E. Meteorology

The ISCST2 modeling was performed using five years of meteorological data recorded at the National Weather Service office in Jacksonville, Florida. The meteorological data was obtained from the Florida DEP in pre-processed form for calendar years 1984 through 1988.

F. Model Receptors

The ISCST2 modeling was performed using a polar receptor grid. The grid was centered on the intersection of UTM coordinates 3357.635 kilometers North and 427.885 kilometers East, zone 17, which are the coordinates of process boiler 2 (see Figure 1). Receptors were placed along 36 radials starting with the 10 degree flow vector, with a radial every ten degrees. Along each radial, receptors were located at the property line and at downwind distances of 75, 100, 150,

200, 300, 400, 500, 600, 700, 800, 900, 1,000, 1,500, 2,000, 3,000, 4,000, and 5,000 meters. Radial/distance combinations which placed receptors on plant property were not modeled. Additional receptors were placed along the railroad tracks which bisect plant property.

All receptors were assigned a terrain elevation of zero, since the terrain surrounding the facility is flat. A summary of all receptors is presented in Table 4. Figure 2 contains a U.S.G.S. map showing the facility and the surrounding area. The polar receptor grid was entered as discrete cartesian receptors in the model.

G. Model Source Groups

Three separate model source groups were evaluated for each scenario with the exception of scenario #1.The first model source group assumed that both boilers were operating simultaneously but only one of them ,Boiler #2 was emitting all the SO2 from TRS incineration The other boiler (#3) was only being operated for meeting the heat load demand and was using only the fuel required to sustain that load. The second model source group assumed all the SO2 emissions from TRS incineration were from boiler # 3, with Boiler # 2 operated only to meet the heat load demand for steam production. The third model source group assumed the emissions were divided evenly between boilers 2 and 3 and both boilers are operating simultaneously. Fuel oil is assumed to be in use for scenarios 1, 5A,5B,5C,6A,6B and 6C. Natural Gas is assumed for rest of the scenarios. The emission rate for some of the scenarios like 2A or 2B is zero because it is assumed that sulfur content of the natural gas being used is negligible and TRS incineration does not occur in one of the boilers.

For each scenario and averaging period modeled, the impact from the source group which produced the highest concentration was added to background ambient air concentrations for comparison to the Florida Air Quality Standards (FAQS) for SO_2.

The background ambient air concentrations were based on the maximum monitored SO_2 concentrations from the monitoring site at Kooker Park in Jacksonville for calendar year 1993. Attachment A contains a summary of the monitored values.

H. Model Results

The results indicate that the maximum impacts for all modeling scenarios are less than the 3-hour, 24-hour, and annual FAQS for the pollutant SO_2. A summary of the maximum predicted impacts

for each modeling scenario and source group are presented in Table 5. The model input and output files are contained on a computer diskette submitted with this report.

It should also be noted that some additional test runs (not included in report) were performed with a stack diameter of three feet (both stacks are currently four feet in diameter). The results using three foot diameter stacks for both boilers indicate a reduction in air quality impact of approximately ten to fifteen percent from the concentrations reported in Table 5.

Table 1 Emissions Inventory and Stack Parameters

TABLE 1: EMISSIONS INVENTORY AND STACK PARAMETERS.

INDIVIDUAL SOURCE NAME	NOTES	MODEL SOURCE NUMBER	SOURCE TYPE	STACK DIR.	RAINCAP OR DOWN	Fuel Types	SO2 EMISSION RATE ton/year	lb/hr	gm/sec
Process Boiler 2	Scenario 1	1A	POINT	vert.	no	No. 6 Oil	250	57.078	7.192
Process Boiler 3	Scenario 1	1B	POINT	vert.	no	No. 6 Oil	249	56.849	7.163
Process Boiler 3	Scenario 2A	2A	POINT	vert.	no	TRS + Natural Gas	740	168.950	21.288
Process Boiler 2	Scenario 2B	2B	POINT	vert.	no	TRS + Natural Gas	740	168.950	21.288
Process Boiler 2 + 3	Scenario 2C	2CA	POINT	vert.	no	TRS + Natural Gas	370	84.475	10.644
Process Boiler 2 + 3	Scenario 2C	2CB	POINT	vert.	no	TRS + Natural Gas	370	84.475	10.644
Process Boiler 3	Scenario 3A	3A	POINT	vert.	no	TRS + Natural Gas	1103	251.826	31.730
Process Boiler 2	Scenario 3B	3B	POINT	vert.	no	TRS + Natural Gas	1103	251.826	31.730
Process Boiler 2 + 3	Scenario 3C	3CA	POINT	vert.	no	TRS + Natural Gas	552	126.027	15.879
Process Boiler 2 + 3	Scenario 3C	3CB	POINT	vert.	no	TRS + Natural Gas	551	125.799	15.851
Process Boiler 3	Scenario 4A	4A	POINT	vert.	no	TRS + Natural Gas	1704	389.041	49.019
Process Boiler 2	Scenario 4B	4B	POINT	vert.	no	TRS + Natural Gas	1704	389.041	49.019
Process Boiler 2 + 3	Scenario 4C	4CA	POINT	vert.	no	TRS + Natural Gas	852	194.521	24.510
Process Boiler 2 + 3	Scenario 4C	4CB	POINT	vert.	no	TRS + Natural Gas	852	194.521	24.510
Process Boiler 2	Scenario 5A	5AA	POINT	vert.	no	TRS + No. 6 Oil	250	57.078	7.192
Process Boiler 3	Scenario 5A	5AB	POINT	vert.	no	TRS + No. 6 Oil	1953	445.890	56.182
Process Boiler 2	Scenario 5B	5BA	POINT	vert.	no	TRS + No. 6 Oil	1954	446.119	56.211
Process Boiler 3	Scenario 5B	5BB	POINT	vert.	no	TRS + No. 6 Oil	249	56.849	7.163
Process Boiler 2 + 3	Scenario 5C	5CA	POINT	vert.	no	TRS + No. 6 Oil	1102	251.598	31.701
Process Boiler 2 + 3	Scenario 5C	5CB	POINT	vert.	no	TRS + No. 6 Oil	1101	251.370	31.673
Process Boiler 2	Scenario 6A	6AA	POINT	vert.	no	TRS + No. 6 Oil	250	57.078	7.192
Process Boiler 3	Scenario 6A	6AB	POINT	vert.	no	TRS + No. 6 Oil	3087	704.795	88.804
Process Boiler 2	Scenario 6B	6BA	POINT	vert.	no	TRS + No. 6 Oil	3088	705.023	88.833
Process Boiler 3	Scenario 6B	6BB	POINT	vert.	no	TRS + No. 6 Oil	249	56.849	7.163
Process Boiler 2 + 3	Scenario 6C	6CA	POINT	vert.	no	TRS + No. 6 Oil	1669	381.050	48.012
Process Boiler 2 + 3	Scenario 6C	6CB	POINT	vert.	no	TRS + No. 6 Oil	1668	380.822	47.984

NOTE: for scenarios 2A, 2B, 3A, 3B, 4A and 4B the emissions shown are from TRS incineration only. Both boilers are firing natural gas for heating purposes in these scenarios.

TABLE 1: EMISSIONS INVENTORY AND STACK PARAMETERS.

INDIVIDUAL POINT SOURCE NAME	MODEL SOURCE NUMBER	STACK HEIGHT		STACK DIAMETER		EXIT TEMPERATURE			FLOW RATE	ACTUAL FLOW VELOCITY			UTM COORDINATE EAST	UTM COORDINATE NORTH	ELEVATION	
		feet	meters	feet	meters	F	C	K	ACFM	ft/min	ft/sec	m/sec	km	km	meters	feet
Process Boiler 2	1A	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 3	1B	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 3	2A	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	2B	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	2CA	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	2CB	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 3	3A	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	3B	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	3CA	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	3CB	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 3	4A	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	4B	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	4CA	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	4CB	67.25	20.50	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	5AA	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 3	5AB	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	5BA	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 3	5BB	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2 + 3	5CA	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	5CB	79.00	24.08	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	6AA	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 3	6AB	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2	6BA	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 3	6BB	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0
Process Boiler 2 + 3	6CA	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.885	3357.635	0	0
Process Boiler 2 + 3	6CB	93.00	28.35	4.00	1.22	595	313	585.9	29,029	2,310	38.5	11.73	427.892	3357.630	0	0

Table 2 GEP Building Wake Analysis

TABLE 2: GEP BUILDING WAKE ANALYSIS

	BUILDING										REGIONS OF INFLUENCE						
	BASE					PROJ. WIDTH		GEP HEIGHT			MINIMUM			MAXIMUM			STACKS
	ELEV	HT	LENGTH	WIDTH	DIAG	MIN	MAX	MIN	MAX	BLDG	.5L	2L	5L	.5L	2L	5L	WITHIN
BUILDING	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	TYPE	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	5L
GUM PLANT	0	37	100	60	117	60	117	93	93	SQUAT	19	74	185	19	74	185	YES
BOILER PLANT	0	26	95	40	103	40	103	65	65	SQUAT	13	52	130	13	52	130	YES

	BUILDING										REGIONS OF INFLUENCE						
	BASE					PROJ. WIDTH		GEP HEIGHT			MINIMUM			MAXIMUM			STACKS
	ELEV	HT	LENGTH	WIDTH	DIAG	MIN	MAX	MIN	MAX	BLDG	.5L	2L	5L	.5L	2L	5L	WITHIN
BUILDING	(M)	(M)	(M)	(M)	(M)	(M)	(M)	(M)	(M)	TYPE	(M)	(M)	(M)	(M)	(M)	(M)	5L
GUM PLANT	0	11.28	30.48	18.29	35.55	18.29	35.55	28.19	28.19	SQUAT	6	23	56	6	23	56	YES
BOILER PLANT	0	7.92	28.96	12.19	31.42	12.19	31.42	19.81	19.81	SQUAT	4	16	40	4	16	40	YES

NOTES: BUILDING WAKE DISTANCES FOR "TALL" OR "TALL/SQUAT" ARE FLAGGED WITH "-".

Table 3 Summary of Cavity Extent Zones for all Buildings

TABLE 3: SUMMARY OF CAVITY EXTENT ZONES FOR ALL BUILDINGS

	BUILDING				WIDTH		CAVITY HEIGHT		MAXIMUM WIDTH ALONGWIND				MINIMUM WIDTH ALONGWIND					
	ELEV	HT	LENGTH	WIDTH	MIN	MAX	MIN	MAX	FACTORS		BLDG	Xr DIST	FACTORS		BLDG	Xr DIST	CAVITY OFF	STACKS WITHIN
BUILDING	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	A	B	TYPE	(FT)	A	B	TYPE	(FT)	PROP	CAVITY
GUM PLANT	0	37	100	60	60	100	39	44	0.66	0.07	LONG	75	1.15	0.11	SHORT	89	NO	N/A
BOILER HOUSE	0	26	95	40	40	95	26	32	0.40	0.05	LONG	51	1.21	0.11	SHORT	81	NO	N/A

	BUILDING				WIDTH		CAVITY HEIGHT		MAXIMUM WIDTH ALONGWIND				MINIMUM WIDTH ALONGWIND					
	ELEV	HT	LENGTH	WIDTH	MIN	MAX	MIN	MAX	FACTORS		BLDG	Xr DIST	FACTORS		BLDG	Xr DIST	CAVITY OFF	STACKS WITHIN
BUILDING	(M)	(M)	(M)	(M)	(M)	(M)	(M)	(M)	A	B	TYPE	(M)	A	B	TYPE	(M)	PROP	CAVITY
GUM PLANT	0.00	11.28	30.48	18.29	18.29	30.48	11.82	13.47	0.66	0.07	LONG	22.77	1.15	0.11	SHORT	27.03	NO	N/A
BOILER HOUSE	0.00	7.92	28.96	12.19	12.19	28.96	8.03	9.64	0.40	0.05	LONG	15.41	1.21	0.11	SHORT	24.62	NO	N/A

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

NAME	DISTANCE meters	COMPASS DIRECTION degrees	UTM EAST meters	UTM NORTH meters	ELEVATION meters	ELEVATION feet	RECEPTOR NUMBER
PROP LINE	55	10	427895	3357689	0	0	1
PROP LINE	63	20	427907	3357694	0	0	2
PROP LINE	77	30	427924	3357702	0	0	3
PROP LINE	100	40	427949	3357712	0	0	4
PROP LINE	158	50	428006	3357737	0	0	5
PROP LINE	331	60	428172	3357801	0	0	6
PROP LINE	305	70	428172	3357739	0	0	7
PROP LINE	291	80	428172	3357686	0	0	8
PROP LINE	225	90	428110	3357635	0	0	9
PROP LINE	229	100	428111	3357595	0	0	10
PROP LINE	239	110	428110	3357553	0	0	11
PROP LINE	258	120	428108	3357506	0	0	12
PROP LINE	242	130	428070	3357479	0	0	13
PROP LINE	199	140	428013	3357483	0	0	14
PROP LINE	251	150	428011	3357418	0	0	15
PROP LINE	364	160	428009	3357293	0	0	16
PROP LINE	365	170	427948	3357276	0	0	17
PROP LINE	359	180	427885	3357276	0	0	18
PROP LINE	365	190	427822	3357276	0	0	19
PROP LINE	383	200	427754	3357275	0	0	20
PROP LINE	340	210	427715	3357341	0	0	21
PROP LINE	265	220	427715	3357432	0	0	22
PROP LINE	223	230	427714	3357492	0	0	23
PROP LINE	196	240	427715	3357537	0	0	24
PROP LINE	180	250	427716	3357573	0	0	25
PROP LINE	171	260	427717	3357605	0	0	26
PROP LINE	116	270	427769	3357635	0	0	27
PROP LINE	84	280	427802	3357650	0	0	28
PROP LINE	66	290	427823	3357658	0	0	29
PROP LINE	57	300	427836	3357664	0	0	30
PROP LINE	52	310	427845	3357668	0	0	31
PROP LINE	48	320	427854	3357672	0	0	32
PROP LINE	47	330	427862	3357676	0	0	33
PROP LINE	47	340	427869	3357679	0	0	34
PROP LINE	48	350	427877	3357682	0	0	35
PROP LINE	50	360	427885	3357685	0	0	36
ON PROP.	175	60	428037	3357723	0	0	37
ON PROP.	145	70	428021	3357685	0	0	38
ON PROP.	133	80	428016	3357658	0	0	39
ON PROP.	130	90	428015	3357635	0	0	40
ON PROP.	132	100	428015	3357612	0	0	41
ON PROP.	138	110	428015	3357588	0	0	42
ON PROP.	149	120	428014	3357561	0	0	43
ON PROP.	169	130	428014	3357526	0	0	44
75 METERS	75	10	427898	3357709	0	0	45
75 METERS	75	20	427911	3357705	0	0	46
75 METERS	75	290	427815	3357661	0	0	47
75 METERS	75	300	427820	3357673	0	0	48
75 METERS	75	310	427828	3357683	0	0	49
75 METERS	75	320	427837	3357692	0	0	50
75 METERS	75	330	427848	3357700	0	0	51
75 METERS	75	340	427859	3357705	0	0	52
75 METERS	75	350	427872	3357709	0	0	53
75 METERS	75	360	427885	3357710	0	0	54
100 METERS	100	10	427902	3357733	0	0	55
100 METERS	100	20	427919	3357729	0	0	56
100 METERS	100	30	427935	3357722	0	0	57
100 METERS	100	280	427787	3357652	0	0	58
100 METERS	100	290	427791	3357669	0	0	59
100 METERS	100	300	427798	3357685	0	0	60
100 METERS	100	310	427808	3357699	0	0	61
100 METERS	100	320	427821	3357712	0	0	62
100 METERS	100	330	427835	3357722	0	0	63
100 METERS	100	340	427851	3357729	0	0	64
100 METERS	100	350	427868	3357733	0	0	65
100 METERS	100	360	427885	3357735	0	0	66

Table 4 ISCST2 Simple Terrain Polar Receptor Grid

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

NAME	DISTANCE meters	COMPASS DIRECTION degrees	UTM EAST meters	UTM NORTH meters	ELEVATION meters	ELEVATION feet	RECEPTOR NUMBER
150 METERS	150	10	427911	3357783	0	0	67
150 METERS	150	20	427936	3357776	0	0	68
150 METERS	150	30	427960	3357765	0	0	69
150 METERS	150	40	427981	3357750	0	0	70
150 METERS	150	270	427735	3357635	0	0	71
150 METERS	150	280	427737	3357661	0	0	72
150 METERS	150	290	427744	3357686	0	0	73
150 METERS	150	300	427755	3357710	0	0	74
150 METERS	150	310	427770	3357731	0	0	75
150 METERS	150	320	427789	3357750	0	0	76
150 METERS	150	330	427810	3357765	0	0	77
150 METERS	150	340	427834	3357776	0	0	78
150 METERS	150	350	427859	3357783	0	0	79
150 METERS	150	360	427885	3357785	0	0	80
200 METERS	200	10	427920	3357832	0	0	81
200 METERS	200	20	427953	3357823	0	0	82
200 METERS	200	30	427985	3357808	0	0	83
200 METERS	200	40	428014	3357788	0	0	84
200 METERS	200	50	428038	3357764	0	0	85
200 METERS	200	240	427712	3357535	0	0	86
200 METERS	200	250	427697	3357567	0	0	87
200 METERS	200	260	427688	3357600	0	0	88
200 METERS	200	270	427685	3357635	0	0	89
200 METERS	200	280	427688	3357670	0	0	90
200 METERS	200	290	427697	3357703	0	0	91
200 METERS	200	300	427712	3357735	0	0	92
200 METERS	200	310	427732	3357764	0	0	93
200 METERS	200	320	427756	3357788	0	0	94
200 METERS	200	330	427785	3357808	0	0	95
200 METERS	200	340	427817	3357823	0	0	96
200 METERS	200	350	427850	3357832	0	0	97
200 METERS	200	360	427885	3357835	0	0	98
300 METERS	300	10	427937	3357930	0	0	99
300 METERS	300	20	427988	3357917	0	0	100
300 METERS	300	30	428035	3357895	0	0	101
300 METERS	300	40	428078	3357865	0	0	102
300 METERS	300	50	428115	3357828	0	0	103
300 METERS	300	90	428185	3357635	0	0	104
300 METERS	300	100	428180	3357583	0	0	105
300 METERS	300	110	428167	3357532	0	0	106
300 METERS	300	120	428145	3357485	0	0	107
300 METERS	300	130	428115	3357442	0	0	108
300 METERS	300	140	428078	3357405	0	0	109
300 METERS	300	150	428035	3357375	0	0	110
300 METERS	300	220	427692	3357405	0	0	111
300 METERS	300	230	427655	3357442	0	0	112
300 METERS	300	240	427625	3357485	0	0	113
300 METERS	300	250	427603	3357532	0	0	114
300 METERS	300	260	427590	3357583	0	0	115
300 METERS	300	270	427585	3357635	0	0	116
300 METERS	300	280	427590	3357687	0	0	117
300 METERS	300	290	427603	3357738	0	0	118
300 METERS	300	300	427625	3357785	0	0	119
300 METERS	300	310	427655	3357828	0	0	120
300 METERS	300	320	427692	3357865	0	0	121
300 METERS	300	330	427735	3357895	0	0	122
300 METERS	300	340	427782	3357917	0	0	123
300 METERS	300	350	427833	3357930	0	0	124
300 METERS	300	360	427885	3357935	0	0	125

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

		COMPASS	UTM				
	DISTANCE	DIRECTION	EAST	NORTH	ELEVATION		RECEPTOR
NAME	meters	degrees	meters	meters	meters	feet	NUMBER
400 METERS	400	10	427954	3358029	0	0	126
400 METERS	400	20	428022	3358011	0	0	127
400 METERS	400	30	428085	3357981	0	0	128
400 METERS	400	40	428142	3357941	0	0	129
400 METERS	400	50	428191	3357892	0	0	130
400 METERS	400	60	428231	3357835	0	0	131
400 METERS	400	70	428261	3357772	0	0	132
400 METERS	400	80	428279	3357704	0	0	133
400 METERS	400	90	428285	3357635	0	0	134
400 METERS	400	100	428279	3357566	0	0	135
400 METERS	400	110	428261	3357498	0	0	136
400 METERS	400	120	428231	3357435	0	0	137
400 METERS	400	130	428191	3357378	0	0	138
400 METERS	400	140	428142	3357329	0	0	139
400 METERS	400	150	428085	3357289	0	0	140
400 METERS	400	160	428022	3357259	0	0	141
400 METERS	400	170	427954	3357241	0	0	142
400 METERS	400	180	427885	3357235	0	0	143
400 METERS	400	190	427816	3357241	0	0	144
400 METERS	400	200	427748	3357259	0	0	145
400 METERS	400	210	427685	3357289	0	0	146
400 METERS	400	220	427628	3357329	0	0	147
400 METERS	400	230	427579	3357378	0	0	148
400 METERS	400	240	427539	3357435	0	0	149
400 METERS	400	250	427509	3357498	0	0	150
400 METERS	400	260	427491	3357566	0	0	151
400 METERS	400	270	427485	3357635	0	0	152
400 METERS	400	280	427491	3357704	0	0	153
400 METERS	400	290	427509	3357772	0	0	154
400 METERS	400	300	427539	3357835	0	0	155
400 METERS	400	310	427579	3357892	0	0	156
400 METERS	400	320	427628	3357941	0	0	157
400 METERS	400	330	427685	3357981	0	0	158
400 METERS	400	340	427748	3358011	0	0	159
400 METERS	400	350	427816	3358029	0	0	160
400 METERS	400	360	427885	3358035	0	0	161
500 METERS	500	10	427972	3358127	0	0	162
500 METERS	500	20	428056	3358105	0	0	163
500 METERS	500	30	428135	3358068	0	0	164
500 METERS	*500*	*40*	*428206*	*3358018*	*0*	*0*	*165*
500 METERS	500	50	428268	3357956	0	0	166
500 METERS	500	60	428318	3357885	0	0	167
500 METERS	500	70	428355	3357806	0	0	168
500 METERS	500	80	428377	3357722	0	0	169
500 METERS	500	90	428385	3357635	0	0	170
500 METERS	500	100	428377	3357548	0	0	171
500 METERS	500	110	428355	3357464	0	0	172
500 METERS	500	120	428318	3357385	0	0	173
500 METERS	500	130	428268	3357314	0	0	174
500 METERS	500	140	428206	3357252	0	0	175
500 METERS	500	150	428135	3357202	0	0	176
500 METERS	500	160	428056	3357165	0	0	177
500 METERS	500	170	427972	3357143	0	0	178
500 METERS	500	180	427885	3357135	0	0	179
500 METERS	500	190	427798	3357143	0	0	180
500 METERS	500	200	427714	3357165	0	0	181
500 METERS	500	210	427635	3357202	0	0	182
500 METERS	500	220	427564	3357252	0	0	183
500 METERS	500	230	427502	3357314	0	0	184
500 METERS	500	240	427452	3357385	0	0	185
500 METERS	500	250	427415	3357464	0	0	186
500 METERS	500	260	427393	3357548	0	0	187
500 METERS	500	270	427385	3357635	0	0	188
500 METERS	500	280	427393	3357722	0	0	189
500 METERS	500	290	427415	3357806	0	0	190
500 METERS	500	300	427452	3357885	0	0	191
500 METERS	500	310	427502	3357956	0	0	192
500 METERS	500	320	427564	3358018	0	0	193
500 METERS	500	330	427635	3358068	0	0	194
500 METERS	500	340	427714	3358105	0	0	195
500 METERS	500	350	427798	3358127	0	0	196
500 METERS	500	360	427885	3358135	0	0	197

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

		COMPASS	UTM				
	DISTANCE	DIRECTION	EAST	NORTH	ELEVATION		RECEPTOR
NAME	meters	degrees	meters	meters	meters	feet	NUMBER
600 METERS	600	10	427989	3358226	0	0	198
600 METERS	600	20	428090	3358199	0	0	199
600 METERS	600	30	428185	3358155	0	0	200
600 METERS	600	40	428271	3358095	0	0	201
600 METERS	600	50	428345	3358021	0	0	202
600 METERS	600	60	428405	3357935	0	0	203
600 METERS	600	70	428449	3357840	0	0	204
600 METERS	600	80	428476	3357739	0	0	205
600 METERS	600	90	428485	3357635	0	0	206
600 METERS	600	100	428476	3357531	0	0	207
600 METERS	600	110	428449	3357430	0	0	208
600 METERS	600	120	428405	3357335	0	0	209
600 METERS	600	130	428345	3357249	0	0	210
600 METERS	600	140	428271	3357175	0	0	211
600 METERS	600	150	428185	3357115	0	0	212
600 METERS	600	160	428090	3357071	0	0	213
600 METERS	600	170	427989	3357044	0	0	214
600 METERS	600	180	427885	3357035	0	0	215
600 METERS	600	190	427781	3357044	0	0	216
600 METERS	600	200	427680	3357071	0	0	217
600 METERS	600	210	427585	3357115	0	0	218
600 METERS	600	220	427499	3357175	0	0	219
600 METERS	600	230	427425	3357249	0	0	220
600 METERS	600	240	427365	3357335	0	0	221
600 METERS	600	250	427321	3357430	0	0	222
600 METERS	600	260	427294	3357531	0	0	223
600 METERS	600	270	427285	3357635	0	0	224
600 METERS	600	280	427294	3357739	0	0	225
600 METERS	600	290	427321	3357840	0	0	226
600 METERS	600	300	427365	3357935	0	0	227
600 METERS	600	310	427425	3358021	0	0	228
600 METERS	600	320	427499	3358095	0	0	229
600 METERS	600	330	427585	3358155	0	0	230
600 METERS	600	340	427680	3358199	0	0	231
600 METERS	600	350	427781	3358226	0	0	232
600 METERS	600	360	427885	3358235	0	0	233
700 METERS	700	10	428007	3358324	0	0	234
700 METERS	700	20	428124	3358293	0	0	235
700 METERS	700	30	428235	3358241	0	0	236
700 METERS	700	40	428335	3358171	0	0	237
700 METERS	700	50	428421	3358085	0	0	238
700 METERS	700	60	428491	3357985	0	0	239
700 METERS	700	70	428543	3357874	0	0	240
700 METERS	700	80	428574	3357757	0	0	241
700 METERS	700	90	428585	3357635	0	0	242
700 METERS	700	100	428574	3357513	0	0	243
700 METERS	700	110	428543	3357396	0	0	244
700 METERS	700	120	428491	3357285	0	0	245
700 METERS	700	130	428421	3357185	0	0	246
700 METERS	700	140	428335	3357099	0	0	247
700 METERS	700	150	428235	3357029	0	0	248
700 METERS	700	160	428124	3356977	0	0	249
700 METERS	700	170	428007	3356946	0	0	250
700 METERS	700	180	427885	3356935	0	0	251
700 METERS	700	190	427763	3356946	0	0	252
700 METERS	700	200	427646	3356977	0	0	253
700 METERS	700	210	427535	3357029	0	0	254
700 METERS	700	220	427435	3357099	0	0	255
700 METERS	700	230	427349	3357185	0	0	256
700 METERS	700	240	427279	3357285	0	0	257
700 METERS	700	250	427227	3357396	0	0	258
700 METERS	700	260	427196	3357513	0	0	259
700 METERS	700	270	427185	3357635	0	0	260
700 METERS	700	280	427196	3357757	0	0	261
700 METERS	700	290	427227	3357874	0	0	262
700 METERS	700	300	427279	3357985	0	0	263
700 METERS	700	310	427349	3358085	0	0	264
700 METERS	700	320	427435	3358171	0	0	265
700 METERS	700	330	427535	3358241	0	0	266
700 METERS	700	340	427646	3358293	0	0	267
700 METERS	700	350	427763	3358324	0	0	268
700 METERS	700	360	427885	3358335	0	0	269

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

NAME	DISTANCE meters	COMPASS DIRECTION degrees	UTM EAST meters	UTM NORTH meters	ELEVATION meters	ELEVATION feet	RECEPTOR NUMBER
800 METERS	800	10	428024	3358423	0	0	270
800 METERS	800	20	428159	3358387	0	0	271
800 METERS	800	30	428285	3358328	0	0	272
800 METERS	800	40	428399	3358248	0	0	273
800 METERS	800	50	428498	3358149	0	0	274
800 METERS	800	60	428578	3358035	0	0	275
800 METERS	800	70	428637	3357909	0	0	276
800 METERS	800	80	428673	3357774	0	0	277
800 METERS	800	90	428685	3357635	0	0	278
800 METERS	800	100	428673	3357496	0	0	279
800 METERS	800	110	428637	3357361	0	0	280
800 METERS	800	120	428578	3357235	0	0	281
800 METERS	800	130	428498	3357121	0	0	282
800 METERS	800	140	428399	3357022	0	0	283
800 METERS	800	150	428285	3356942	0	0	284
800 METERS	800	160	428159	3356883	0	0	285
800 METERS	800	170	428024	3356847	0	0	286
800 METERS	800	180	427885	3356835	0	0	287
800 METERS	800	190	427746	3356847	0	0	288
800 METERS	800	200	427611	3356883	0	0	289
800 METERS	800	210	427485	3356942	0	0	290
800 METERS	800	220	427371	3357022	0	0	291
800 METERS	800	230	427272	3357121	0	0	292
800 METERS	800	240	427192	3357235	0	0	293
800 METERS	800	250	427133	3357361	0	0	294
800 METERS	800	260	427097	3357496	0	0	295
800 METERS	800	270	427085	3357635	0	0	296
800 METERS	800	280	427097	3357774	0	0	297
800 METERS	800	290	427133	3357909	0	0	298
800 METERS	800	300	427192	3358035	0	0	299
800 METERS	800	310	427272	3358149	0	0	300
800 METERS	800	320	427371	3358248	0	0	301
800 METERS	800	330	427485	3358328	0	0	302
800 METERS	800	340	427611	3358387	0	0	303
800 METERS	800	350	427746	3358423	0	0	304
800 METERS	800	360	427885	3358435	0	0	305
900 METERS	900	10	428041	3358521	0	0	306
900 METERS	900	20	428193	3358481	0	0	307
900 METERS	900	30	428335	3358414	0	0	308
900 METERS	900	40	428464	3358324	0	0	309
900 METERS	900	50	428574	3358214	0	0	310
900 METERS	900	60	428664	3358085	0	0	311
900 METERS	900	70	428731	3357943	0	0	312
900 METERS	900	80	428771	3357791	0	0	313
900 METERS	900	90	428785	3357635	0	0	314
900 METERS	900	100	428771	3357479	0	0	315
900 METERS	900	110	428731	3357327	0	0	316
900 METERS	900	120	428664	3357185	0	0	317
900 METERS	900	130	428574	3357056	0	0	318
900 METERS	900	140	428464	3356946	0	0	319
900 METERS	900	150	428335	3356856	0	0	320
900 METERS	900	160	428193	3356789	0	0	321
900 METERS	900	170	428041	3356749	0	0	322
900 METERS	900	180	427885	3356735	0	0	323
900 METERS	900	190	427729	3356749	0	0	324
900 METERS	900	200	427577	3356789	0	0	325
900 METERS	900	210	427435	3356856	0	0	326
900 METERS	900	220	427306	3356946	0	0	327
900 METERS	900	230	427196	3357056	0	0	328
900 METERS	900	240	427106	3357185	0	0	329
900 METERS	900	250	427039	3357327	0	0	330
900 METERS	900	260	426999	3357479	0	0	331
900 METERS	900	270	426985	3357635	0	0	332
900 METERS	900	280	426999	3357791	0	0	333
900 METERS	900	290	427039	3357943	0	0	334
900 METERS	900	300	427106	3358085	0	0	335
900 METERS	900	310	427196	3358214	0	0	336
900 METERS	900	320	427306	3358324	0	0	337
900 METERS	900	330	427435	3358414	0	0	338
900 METERS	900	340	427577	3358481	0	0	339
900 METERS	900	350	427729	3358521	0	0	340
900 METERS	900	360	427885	3358535	0	0	341

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

NAME	DISTANCE meters	COMPASS DIRECTION degrees	UTM EAST meters	UTM NORTH meters	ELEVATION meters	ELEVATION feet	RECEPTOR NUMBER
1000 METERS	1000	10	428059	3358620	0	0	342
1000 METERS	1000	20	428227	3358575	0	0	343
1000 METERS	1000	30	428385	3358501	0	0	344
1000 METERS	1000	40	428528	3358401	0	0	345
1000 METERS	1000	50	428651	3358278	0	0	346
1000 METERS	1000	60	428751	3358135	0	0	347
1000 METERS	1000	70	428825	3357977	0	0	348
1000 METERS	1000	80	428870	3357809	0	0	349
1000 METERS	1000	90	428885	3357635	0	0	350
1000 METERS	1000	100	428870	3357461	0	0	351
1000 METERS	1000	110	428825	3357293	0	0	352
1000 METERS	1000	120	428751	3357135	0	0	353
1000 METERS	1000	130	428651	3356992	0	0	354
1000 METERS	1000	140	428528	3356869	0	0	355
1000 METERS	1000	150	428385	3356769	0	0	356
1000 METERS	1000	160	428227	3356695	0	0	357
1000 METERS	1000	170	428059	3356650	0	0	358
1000 METERS	1000	180	427885	3356635	0	0	359
1000 METERS	1000	190	427711	3356650	0	0	360
1000 METERS	1000	200	427543	3356695	0	0	361
1000 METERS	1000	210	427385	3356769	0	0	362
1000 METERS	1000	220	427242	3356869	0	0	363
1000 METERS	1000	230	427119	3356992	0	0	364
1000 METERS	1000	240	427019	3357135	0	0	365
1000 METERS	1000	250	426945	3357293	0	0	366
1000 METERS	1000	260	426900	3357461	0	0	367
1000 METERS	1000	270	426885	3357635	0	0	368
1000 METERS	1000	280	426900	3357809	0	0	369
1000 METERS	1000	290	426945	3357977	0	0	370
1000 METERS	1000	300	427019	3358135	0	0	371
1000 METERS	1000	310	427119	3358278	0	0	372
1000 METERS	1000	320	427242	3358401	0	0	373
1000 METERS	1000	330	427385	3358501	0	0	374
1000 METERS	1000	340	427543	3358575	0	0	375
1000 METERS	1000	350	427711	3358620	0	0	376
1000 METERS	1000	360	427885	3358635	0	0	377
1500 METERS	1500	10	428145	3359112	0	0	378
1500 METERS	1500	20	428398	3359045	0	0	379
1500 METERS	1500	30	428635	3358934	0	0	380
1500 METERS	1500	40	428849	3358784	0	0	381
1500 METERS	1500	50	429034	3358599	0	0	382
1500 METERS	1500	60	429184	3358385	0	0	383
1500 METERS	1500	70	429295	3358148	0	0	384
1500 METERS	1500	80	429362	3357895	0	0	385
1500 METERS	1500	90	429385	3357635	0	0	386
1500 METERS	1500	100	429362	3357375	0	0	387
1500 METERS	1500	110	429295	3357122	0	0	388
1500 METERS	1500	120	429184	3356885	0	0	389
1500 METERS	1500	130	429034	3356671	0	0	390
1500 METERS	1500	140	428849	3356486	0	0	391
1500 METERS	1500	150	428635	3356336	0	0	392
1500 METERS	1500	160	428398	3356225	0	0	393
1500 METERS	1500	170	428145	3356158	0	0	394
1500 METERS	1500	180	427885	3356135	0	0	395
1500 METERS	1500	190	427625	3356158	0	0	396
1500 METERS	1500	200	427372	3356225	0	0	397
1500 METERS	1500	210	427135	3356336	0	0	398
1500 METERS	1500	220	426921	3356486	0	0	399
1500 METERS	1500	230	426736	3356671	0	0	400
1500 METERS	1500	240	426586	3356885	0	0	401
1500 METERS	1500	250	426475	3357122	0	0	402
1500 METERS	1500	260	426408	3357375	0	0	403
1500 METERS	1500	270	426385	3357635	0	0	404
1500 METERS	1500	280	426408	3357895	0	0	405
1500 METERS	1500	290	426475	3358148	0	0	406
1500 METERS	1500	300	426586	3358385	0	0	407
1500 METERS	1500	310	426736	3358599	0	0	408
1500 METERS	1500	320	426921	3358784	0	0	409
1500 METERS	1500	330	427135	3358934	0	0	410
1500 METERS	1500	340	427372	3359045	0	0	411
1500 METERS	1500	350	427625	3359112	0	0	412
1500 METERS	1500	360	427885	3359135	0	0	413

FILENAME: INV2 DATE: 6-16-95 CLIENT: BUSH BOAKE ALLEN (87534.104)

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

		COMPASS	UTM				
	DISTANCE	DIRECTION	EAST	NORTH	ELEVATION		RECEPTOR
NAME	meters	degrees	meters	meters	meters	feet	NUMBER
2000 METERS	2000	10	428232	3359605	0	0	414
2000 METERS	2000	20	428569	3359514	0	0	415
2000 METERS	2000	30	428885	3359367	0	0	416
2000 METERS	2000	40	429171	3359167	0	0	417
2000 METERS	2000	50	429417	3358921	0	0	418
2000 METERS	2000	60	429617	3358635	0	0	419
2000 METERS	2000	70	429764	3358319	0	0	420
2000 METERS	2000	80	429855	3357982	0	0	421
2000 METERS	2000	90	429885	3357635	0	0	422
2000 METERS	2000	100	429855	3357288	0	0	423
2000 METERS	2000	110	429764	3356951	0	0	424
2000 METERS	2000	120	429617	3356635	0	0	425
2000 METERS	2000	130	429417	3356349	0	0	426
2000 METERS	2000	140	429171	3356103	0	0	427
2000 METERS	2000	150	428885	3355903	0	0	428
2000 METERS	2000	160	428569	3355756	0	0	429
2000 METERS	2000	170	428232	3355665	0	0	430
2000 METERS	2000	180	427885	3355635	0	0	431
2000 METERS	2000	190	427538	3355665	0	0	432
2000 METERS	2000	200	427201	3355756	0	0	433
2000 METERS	2000	210	426885	3355903	0	0	434
2000 METERS	2000	220	426599	3356103	0	0	435
2000 METERS	2000	230	426353	3356349	0	0	436
2000 METERS	2000	240	426153	3356635	0	0	437
2000 METERS	2000	250	426006	3356951	0	0	438
2000 METERS	2000	260	425915	3357288	0	0	439
2000 METERS	2000	270	425885	3357635	0	0	440
2000 METERS	2000	280	425915	3357982	0	0	441
2000 METERS	2000	290	426006	3358319	0	0	442
2000 METERS	2000	300	426153	3358635	0	0	443
2000 METERS	2000	310	426353	3358921	0	0	444
2000 METERS	2000	320	426599	3359167	0	0	445
2000 METERS	2000	330	426885	3359367	0	0	446
2000 METERS	2000	340	427201	3359514	0	0	447
2000 METERS	2000	350	427538	3359605	0	0	448
2000 METERS	2000	360	427885	3359635	0	0	449
3000 METERS	3000	10	428406	3360589	0	0	450
3000 METERS	3000	20	428911	3360454	0	0	451
3000 METERS	3000	30	429385	3360233	0	0	452
3000 METERS	3000	40	429813	3359933	0	0	453
3000 METERS	3000	50	430183	3359563	0	0	454
3000 METERS	3000	60	430483	3359135	0	0	455
3000 METERS	3000	70	430704	3358661	0	0	456
3000 METERS	3000	80	430839	3358156	0	0	457
3000 METERS	3000	90	430885	3357635	0	0	458
3000 METERS	3000	100	430839	3357114	0	0	459
3000 METERS	3000	110	430704	3356609	0	0	460
3000 METERS	3000	120	430483	3356135	0	0	461
3000 METERS	3000	130	430183	3355707	0	0	462
3000 METERS	3000	140	429813	3355337	0	0	463
3000 METERS	3000	150	429385	3355037	0	0	464
3000 METERS	3000	160	428911	3354816	0	0	465
3000 METERS	3000	170	428406	3354681	0	0	466
3000 METERS	3000	180	427885	3354635	0	0	467
3000 METERS	3000	190	427364	3354681	0	0	468
3000 METERS	3000	200	426859	3354816	0	0	469
3000 METERS	3000	210	426385	3355037	0	0	470
3000 METERS	3000	220	425957	3355337	0	0	471
3000 METERS	3000	230	425587	3355707	0	0	472
3000 METERS	3000	240	425287	3356135	0	0	473
3000 METERS	3000	250	425066	3356609	0	0	474
3000 METERS	3000	260	424931	3357114	0	0	475
3000 METERS	3000	270	424885	3357635	0	0	476
3000 METERS	3000	280	424931	3358156	0	0	477
3000 METERS	3000	290	425066	3358661	0	0	478
3000 METERS	3000	300	425287	3359135	0	0	479
3000 METERS	3000	310	425587	3359563	0	0	480
3000 METERS	3000	320	425957	3359933	0	0	481
3000 METERS	3000	330	426385	3360233	0	0	482
3000 METERS	3000	340	426859	3360454	0	0	483
3000 METERS	3000	350	427364	3360589	0	0	484
3000 METERS	3000	360	427885	3360635	0	0	485

TABLE 4: ISCST2 SIMPLE TERRAIN POLAR RECEPTOR GRID.

	UTM	
	EAST meters	NORTH meters
CENTER:	427885	3357635

NAME	DISTANCE meters	COMPASS DIRECTION degrees	UTM EAST meters	UTM NORTH meters	ELEVATION meters	ELEVATION feet	RECEPTOR NUMBER
4000 METERS	4000	10	428580	3361574	0	0	486
4000 METERS	4000	20	429253	3361394	0	0	487
4000 METERS	4000	30	429885	3361099	0	0	488
4000 METERS	4000	40	430456	3360699	0	0	489
4000 METERS	4000	50	430949	3360206	0	0	490
4000 METERS	4000	60	431349	3359635	0	0	491
4000 METERS	4000	70	431644	3359003	0	0	492
4000 METERS	4000	80	431824	3358330	0	0	493
4000 METERS	4000	90	431885	3357635	0	0	494
4000 METERS	4000	100	431824	3356940	0	0	495
4000 METERS	4000	110	431644	3356267	0	0	496
4000 METERS	4000	120	431349	3355635	0	0	497
4000 METERS	4000	130	430949	3355064	0	0	498
4000 METERS	4000	140	430456	3354571	0	0	499
4000 METERS	4000	150	429885	3354171	0	0	500
4000 METERS	4000	160	429253	3353876	0	0	501
4000 METERS	4000	170	428580	3353696	0	0	502
4000 METERS	4000	180	427885	3353635	0	0	503
4000 METERS	4000	190	427190	3353696	0	0	504
4000 METERS	4000	200	426517	3353876	0	0	505
4000 METERS	4000	210	425885	3354171	0	0	506
4000 METERS	4000	220	425314	3354571	0	0	507
4000 METERS	4000	230	424821	3355064	0	0	508
4000 METERS	4000	240	424421	3355635	0	0	509
4000 METERS	4000	250	424126	3356267	0	0	510
4000 METERS	4000	260	423946	3356940	0	0	511
4000 METERS	4000	270	423885	3357635	0	0	512
4000 METERS	4000	280	423946	3358330	0	0	513
4000 METERS	4000	290	424126	3359003	0	0	514
4000 METERS	4000	300	424421	3359635	0	0	515
4000 METERS	4000	310	424821	3360206	0	0	516
4000 METERS	4000	320	425314	3360699	0	0	517
4000 METERS	4000	330	425885	3361099	0	0	518
4000 METERS	4000	340	426517	3361394	0	0	519
4000 METERS	4000	350	427190	3361574	0	0	520
4000 METERS	4000	360	427885	3361635	0	0	521
5000 METERS	5000	10	428753	3362559	0	0	522
5000 METERS	5000	20	429595	3362333	0	0	523
5000 METERS	5000	30	430385	3361965	0	0	524
5000 METERS	5000	40	431099	3361465	0	0	525
5000 METERS	5000	50	431715	3360849	0	0	526
5000 METERS	5000	60	432215	3360135	0	0	527
5000 METERS	5000	70	432583	3359345	0	0	528
5000 METERS	5000	80	432809	3358503	0	0	529
5000 METERS	5000	90	432885	3357635	0	0	530
5000 METERS	5000	100	432809	3356767	0	0	531
5000 METERS	5000	110	432583	3355925	0	0	532
5000 METERS	5000	120	432215	3355135	0	0	533
5000 METERS	5000	130	431715	3354421	0	0	534
5000 METERS	5000	140	431099	3353805	0	0	535
5000 METERS	5000	150	430385	3353305	0	0	536
5000 METERS	5000	160	429595	3352937	0	0	537
5000 METERS	5000	170	428753	3352711	0	0	538
5000 METERS	5000	180	427885	3352635	0	0	539
5000 METERS	5000	190	427017	3352711	0	0	540
5000 METERS	5000	200	426175	3352937	0	0	541
5000 METERS	5000	210	425385	3353305	0	0	542
5000 METERS	5000	220	424671	3353805	0	0	543
5000 METERS	5000	230	424055	3354421	0	0	544
5000 METERS	5000	240	423555	3355135	0	0	545
5000 METERS	5000	250	423187	3355925	0	0	546
5000 METERS	5000	260	422961	3356767	0	0	547
5000 METERS	5000	270	422885	3357635	0	0	548
5000 METERS	5000	280	422961	3358503	0	0	549
5000 METERS	5000	290	423187	3359345	0	0	550
5000 METERS	5000	300	423555	3360135	0	0	551
5000 METERS	5000	310	424055	3360849	0	0	552
5000 METERS	5000	320	424671	3361465	0	0	553
5000 METERS	5000	330	425385	3361965	0	0	554
5000 METERS	5000	340	426175	3362333	0	0	555
5000 METERS	5000	350	427017	3362559	0	0	556
5000 METERS	5000	360	427885	3362635	0	0	557

FILENAME: INV2 DATE: 6-16-95 CLIENT: BUSH BOAKE ALLEN (87534.104)

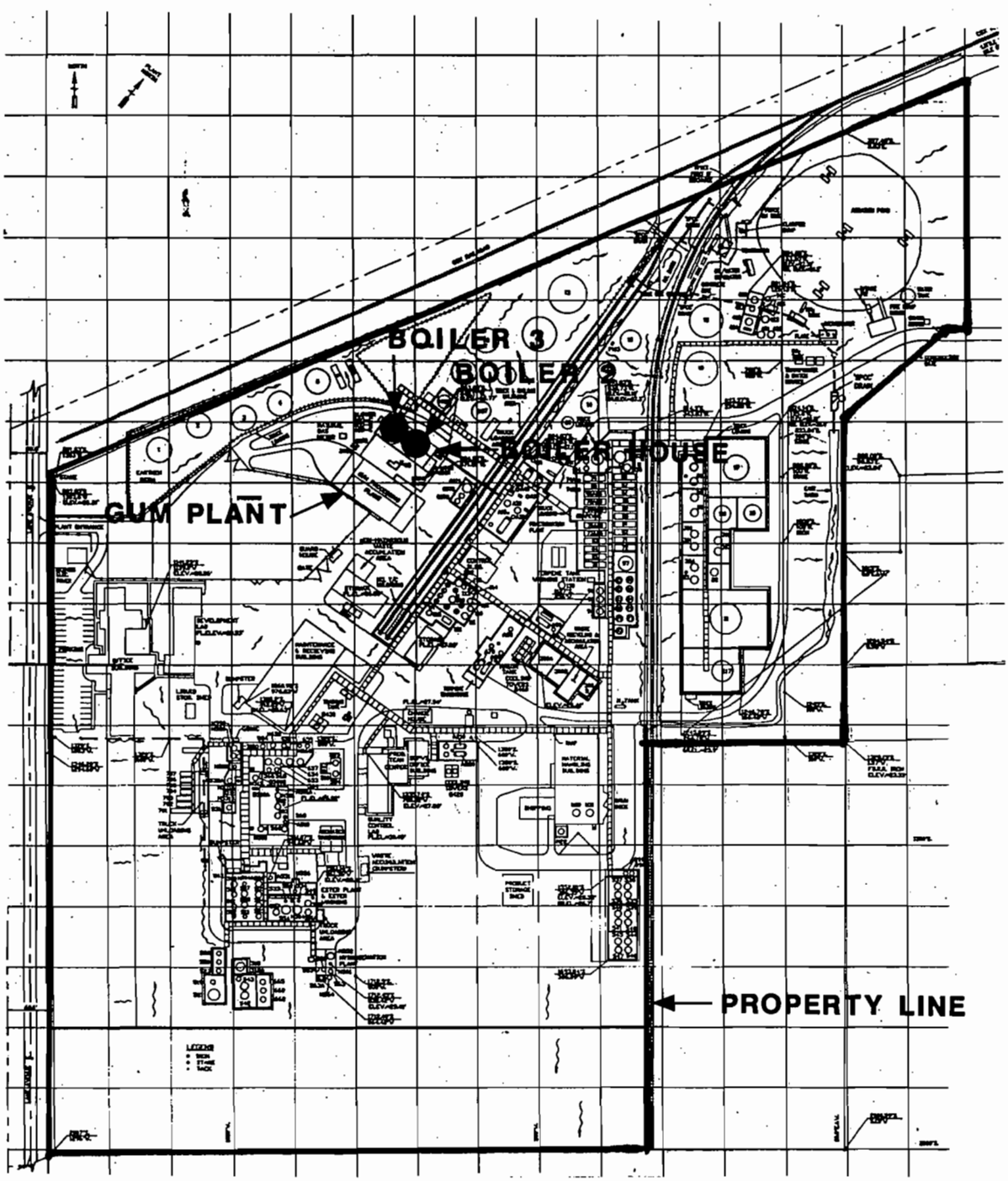
Table 5 SO_2 REFINED Model Results

TABLE 5: SO2 REFINED MODELING IMPACTS

		SCENARIO 1			SCENARIO 2			SCENARIO 3			SCENARIO 4			SCENARIO 5			SCENARIO 6		
		FUELS: No. 6 Oil			FUELS: TRS + Natural Gas			FUELS: TRS + Natural Gas			FUELS: TRS + Natural Gas			FUELS: TRS + No. 6 Oil			FUELS: TRS + No. 6 Oil		
		TPY SO2: 499			TPY SO2: 740			TPY SO2: 1103			TPY SO2: 1704			TPY SO2: 2203			TPY SO2: 3337		
YEAR	SUB-SCENARIO	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)	3-HOUR (ug/m3)	24-HOUR (ug/m3)	ANNUAL (ug/m3)
1984	A	146.79	57.91	2.91	303.52	79.29	5.06	452.40	118.18	7.54	698.90	182.58	11.66	488.00	195.63	9.98	418.62	187.30	12.99
	B	N/A	N/A	N/A	254.21	88.51	4.42	378.90	131.93	6.59	585.35	203.81	10.18	392.22	196.33	9.99	418.33	187.58	12.98
	C	N/A	N/A	N/A	217.60	85.84	4.31	324.39	127.98	6.43	501.08	197.67	9.93	366.33	195.98	9.99	418.48	187.44	12.99
1985	A	154.78	51.70	3.58	218.31	81.56	5.77	325.39	121.57	8.60	502.68	187.81	13.29	396.33	168.06	11.31	418.07	165.69	12.58
	B	N/A	N/A	N/A	214.83	71.81	4.88	320.20	107.04	7.27	494.67	165.36	11.24	422.64	160.45	11.03	424.85	162.52	12.50
	C	N/A	N/A	N/A	229.66	76.69	5.31	342.22	114.29	7.92	528.84	176.59	12.23	405.75	164.25	11.17	420.74	164.11	12.54
1986	A	135.81	47.02	3.47	236.56	86.73	6.13	352.60	129.27	9.13	544.73	199.70	14.11	402.55	131.89	9.93	480.29	127.58	12.41
	B	N/A	N/A	N/A	266.86	71.76	5.18	397.75	106.97	7.73	614.48	165.25	11.94	403.58	139.22	9.51	477.28	128.38	12.41
	C	N/A	N/A	N/A	201.48	69.72	5.15	300.26	103.93	7.68	463.95	160.55	11.87	403.06	138.89	9.51	478.79	127.98	12.41
1987	A	172.80	50.42	3.96	270.12	82.65	6.08	402.61	123.19	9.06	621.99	190.32	14.00	455.87	157.06	12.61	431.04	158.87	15.74
	B	N/A	N/A	N/A	242.45	73.73	5.65	361.37	109.89	8.42	558.28	169.77	13.02	441.59	154.06	12.49	444.61	157.48	15.75
	C	N/A	N/A	N/A	256.28	74.78	5.87	381.97	111.46	8.74	590.14	172.19	13.51	448.63	155.56	12.55	438.09	158.17	15.74
1988	A	160.77	38.80	2.90	274.45	60.39	5.14	409.07	90.01	7.66	631.96	139.06	11.84	473.63	126.20	10.55	435.56	137.18	13.72
	B	N/A	N/A	N/A	232.39	63.72	4.23	346.38	94.98	6.30	535.12	146.72	9.74	375.08	107.57	10.55	434.31	138.97	13.71
	C	N/A	N/A	N/A	238.50	57.54	4.30	355.43	85.77	6.40	549.19	132.51	9.89	424.36	115.94	10.55	434.94	138.08	13.71
MAXIMUM		172.80	57.91	3.96	303.52	88.51	6.13	452.40	131.93	9.13	698.90	203.81	14.11	488.00	196.33	12.61	480.29	187.58	15.75
BACKGROUND		165.00	44.00	7.00	165.00	44.00	7.00	165.00	44.00	7.00	165.00	44.00	7.00	165.00	44.00	7.00	165.00	44.00	7.00
TOTAL IMPACT		337.80	101.91	10.96	468.52	132.51	13.13	617.40	175.93	16.13	863.90	247.81	21.11	653.00	240.33	19.61	645.29	231.58	22.75
FAQS		1300.00	260.00	60.00	1300.00	260.00	60.00	1300.00	260.00	60.00	1300.00	260.00	60.00	1300.00	260.00	60.00	1300.00	260.00	60.00
% OF FAQS		26%	39%	18%	36%	51%	22%	47%	68%	27%	66%	95%	35%	50%	92%	33%	50%	89%	38%

Notes: 3-hour and 24-hour impacts are highest-second high impacts.
Annual impacts are highest impacts.
Background values are highest monitored concentrations recorded at "Kooker Park" during calendar year 1993.

Figure 1 Facility Plot Plan



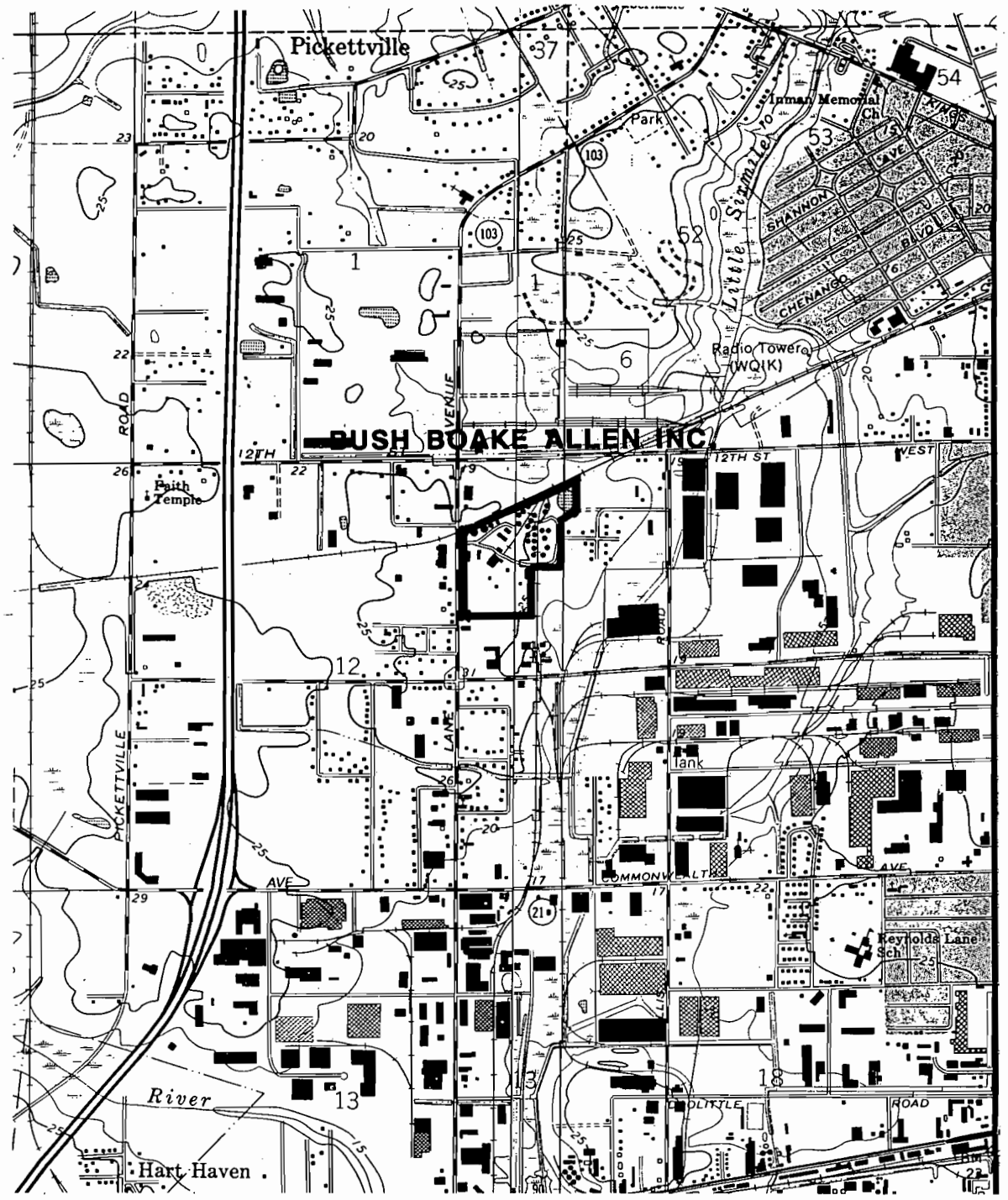
RUST ENVIRONMENT & INFRASTRUCTURE

Figure 1

Facility Plot Plan

Scale 1″ ≈ 265′

Figure 2 U.S.G.S. Map



RUST ENVIRONMENT & INFRASTRUCTURE

Figure 2

U.S.G.S. Map

ATTACHMENT A

1993 AMBIENT MONITORING CONCENTRATIONS

POLLUTANT: SULFUR DIOXIDE STATE: 10 FLORIDA YEAR: 1993

CNTY	AREA	SITE	LOCATION	SMPLNG PERIOD	METH	NUM OBS	MAXIMA 1-HOUR 1ST	1-HOUR 2ND	3-HOUR 1ST	3-HOUR 2ND	24-HOUR 1ST	24-HOUR 2ND	ARTH MEAN	GSD	EXCEEDANCES * 3HR #>1300	24HR #>260	ANNL AM>60
BRVRD	0680	001 GO2	COCOA/ 6655 CARALE AVE.	JAN-JUL	20	4738	79	3	28	3	6	3	3	1.05			
BRWRD	1260	010 GO2	FT. LAUDERDALE/ N.W. CORNER OF LINC	JAN-DEC	20	8354	228	157	139	133	33	31	6	1.93			
CTRUS	0580	003 JO2	CRYSTAL RIVER/ TWIN RIVERS MARINA O	JAN-JUN	20	3791	189	157	132	119	23	21	4	1.50			
	0580	005 JO2	CRYSTAL RIVER/ E OF FPC PLT, NEAR R	JAN-JUN	20	4329	328	309	288	255	62	56	8	2.36			
DADE	0860	019 GO2	MIAMI/ DDT2US 27 & SR 821 #34, DADE	JAN-DEC	20	7939	47	39	35	30	13	11	4	1.52			
DUVAL	1960	032 HO2	JACKSONVILLE/ KOOKER PARK 2900 BENN	JAN-DEC	20	8004	257	257	165	155	44	43	7	2.23			
	1960	080 HO2	JACKSONVILLE/ 1605 MINERVA ST JACKS	JAN-DEC	20	8414	516	479	428	318	197	96	7	2.24			
	1960	081 HO2	JACKSONVILLE/ CEDAR BAY STP, 1840 C	JAN-DEC	20	8461	608	511	353	324	61	60	8	2.30			
	1960	097 HO2	JACKSONVILLE/ 6241 FORT CAROLINE RO	JAN-DEC	20	8206	451	419	371	255	133	90	9	2.41			
ESCAM	3540	004 FO1	PENSACOLA/ ELLYSON INDUSTRIAL PARK	JAN-DEC	20	8680	561	472	395	386	142	101	14	2.66			
	3540	022 FO2	PENSACOLA/ 11000 UNIVERSITY PARKWAY	JAN-DEC	20	8434	791	749	665	596	236	181	16	2.94			
HAMIL	1660	015 FO2	WHITE SPRINGS/ COUNTY RD 137 AT ENT	JAN-DEC	20	8598	655	647	495	445	174	136	15	2.90			
HERNA	1740	006 GO2	BROOKSVILLE/ 17045 FT. DADE AVE. (L	JAN-DEC	20	8393	121	100	82	77	25	21	4	1.78			
HILLS	1800	021 GO2	/ TECO =2 BB CO BARN ON BIG BEND RD	JAN-DEC	20	8504	346	341	292	177	52	36	5	1.77			
	1800	081 GO3	HILLSBOROUGH BAY/ SIMONS PARK, #113	JAN-DEC	20	8691	521	461	376	366	166	112	13	2.90			
	1800	095 GO2	TAMPA/ 5012 CAUSEWAY BLVD TAMPA(GAN	JAN-DEC	20	8676	697	645	410	409	108	90	14	2.86			
	1800	106 JO2	NORTH RUSKIN/ BIG BEND RD. 1.5 MI E	JAN-DEC	20	8439	739	579	549	383	87	80	12	2.60			
	1800	107 JO2	NORTH RUSKIN/ BULLFROG CREEK COUNTY	JAN-DEC	20	7580	1058	941	878	596	153	92	12	2.56			
	1800	108 GO2	GIBSONTON/ GIANTS CAMP, U.S. HWY. 4	JAN-DEC	20	8273	592	576	552	472	158	157	18	3.16			
	4360	035 GO2	TAMPA/ COAST GUARD STA DAVIS IS, TA	JAN-DEC	20	8597	495	411	304	301	96	87	25	2.61			
	4360	053 GO2	TAMPA/ BALLAST PT PARK, INTERBAY BL	JAN-DEC	20	8670	351	314	196	194	71	58	14	2.75			
	4360	068 GO1	TAMPA - NORTHDALE/ 4013 RAGG ROAD,	JAN-DEC	20	8658	647	545	422	357	86	70	9	2.38			
MANAT	2540	026 GO2	PARRISH/ FP&L SOUTH ON THE WISENANT	JAN-DEC	20	8206	689	482	410	392	88	70	10	2.22			
	2540	027 GO2	PARRISH/ WEST SIDE OF FP&L COOLING	JAN-DEC	20	8539	833	613	527	452	113	82	13	2.37			
	3440	002 GO2	PALMETTO/ PORT MANATEE, REEDER RD.	JAN-DEC	20	8617	663	626	488	474	186	179	13	2.84			
NASSA	1200	005 FO2	FERNANDINA BEACH/ WWTP, 5TH ST N OF	JAN-DEC	20	8650	506	414	334	309	157	127	12	2.77			
	1200	009 FO2	FERNANDINA BEACH/ FERNANDINA BEACH	JAN-DEC	20	8608	186	173	155	73	31	28	6	2.05			
ORANG	4900	002 GO1	WINTER PARK/ LAKE ISLE ESTATES, WIN	JAN-DEC	20	8587	178	149	118	117	38	32	6	1.95			
PALM	3420	017 JO2	BELLE GLADE/ DUDA RD. 1MI S. OF OLD	JAN-SEP	20	5839	58	29	24	22	10	10	3	1.40			
	3840	004 GO2	RIVIERA BEACH/ 1050 15TH ST. WEST	JAN-DEC	20	7959	479	427	289	268	76	75	10	2.20			
PINEL	3620	002 GO5	PINELLAS PARK/ 11500 43RD AVE N PIN	JAN-DEC	20	8594	576	514	421	417	139	127	13	2.89			
	3980	023 GO2	ST PETERSBURG/ DERBY LANE 10100 SAN	JAN-DEC	20	8543	713	700	661	638	173	160	22	3.24			
	4380	001 GO2	TARPON SPRINGS/ 303A ANCLOTE RD, TA	JAN-DEC	20	8624	238	231	178	138	58	36	6	2.02			
	4380	002 GO3	TARPON SPRINGS/ BROOKER CREEK PK TA	JAN-DEC	20	8507	254	220	186	177	45	43	7	2.30			
POLK	2860	006 FO2	MULBERRY/ MULBERRY HIGH SCHOOL, NE	JAN-DEC	20	8234	275	259	201	199	55	47	9	2.42			
	3680	010 FO2	/ ANDERSON & PINE-CREST RD, NICHOLS	JAN-DEC	20	8492	325	314	266	221	61	55	11	2.39			
PUTNM	3780	007 JO2	PALATKA/ WEST RIVER RD AND SR17 (PU	JAN-DEC	20	8670	364	283	248	193	61	52	5	1.76			
	3780	008 FO2	PALATKA/ 100 FT W. OF INTERSEC OF C	JAN-DEC	20	8644	364	275	216	188	65	50	8	2.33			
SARAS	4080	002 GO1	SARASOTA/ 3636 S. SHADE AVE. (SHADE	JAN-DEC	20	8285	288	265	217	176	63	51	7	2.16			
	4100	012 GO1	SARASOTA COUNTY/ VERNA WELL FIELD (	JAN-JAN	20	106	3	3	3	3	3	3	3	1.00			

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* THE AIR QUALITY STANDARDS FOR SO2 ARE AN ANNUAL ARITHMETIC AVERAGE OF 60 UG/M3, A MAXIMUM 24-HOUR CONCENTRATION OF 260 UG/M3 NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR, AND A MAXIMUM 3-HOUR CONCENTRATION OF 1300 UG/M3 NOT TO BE

① 0310071-AC

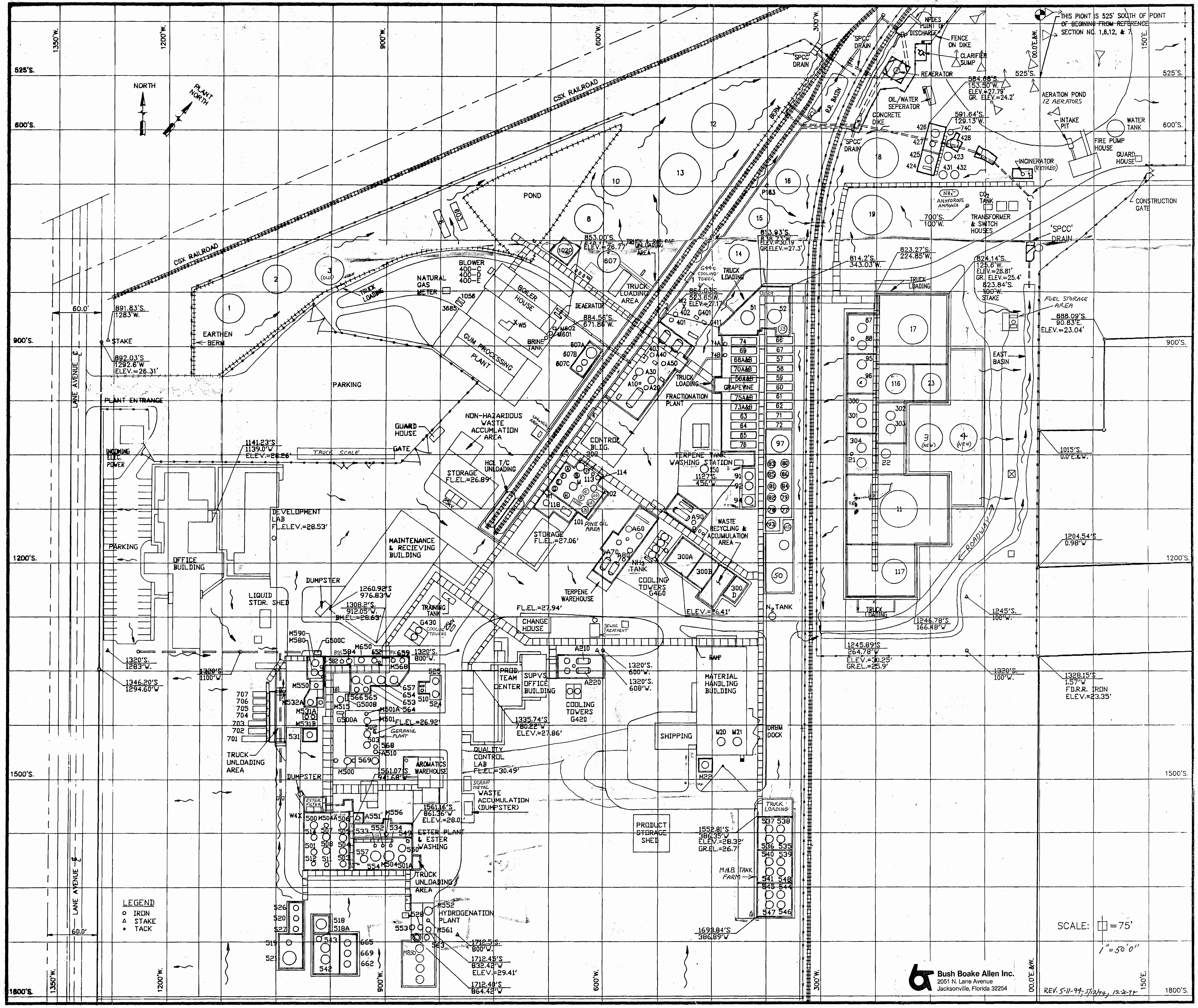

Exhibit #8 site plan