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21 Attorneys for Plaintiff United States of America

22 IN THE UNITED STATES DISTRICT COURT  
23 FOR THE DISTRICT OF ARIZONA

24 UNITED STATES OF AMERICA, )  
25 )  
26 Plaintiff, )

27 v. ) Civil Action No.

28 ) CONSENT DECREE (Proposed)

29 APACHE NITROGEN PRODUCTS, )  
30 INC., )  
31 Defendant. )

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1 WHEREAS, Plaintiff United States of America on behalf of the United  
2 States Environmental Protection Agency (the "United States") has concurrently  
3 filed a civil action against Defendant Apache Nitrogen Products, Inc. ("ANP") for  
4 civil penalties and injunctive relief based on alleged violations of the Clean Air Act  
5 ("CAA"), 42 U.S.C. § 7401 *et seq.*, and the Implementation Plan for the State of  
6 Arizona ("SIP") approved by EPA pursuant to the CAA;  
7  
8

9  
10 WHEREAS, the civil action relates to a nitric acid production unit owned  
11 and operated by ANP near Saint David, Arizona (the "ANP facility"), referred to  
12 as AOP-4;  
13

14 WHEREAS, AOP-4 is a dual pressure, Chemico Design nitric acid  
15 production unit commissioned in the 1970s that uses refrigerated extended  
16 absorption and hydrogen peroxide injection during startup for purposes of nitrogen  
17 oxide ("NO<sub>x</sub>") emissions control;  
18

19  
20 WHEREAS, the United States alleges that the ANP facility has violated the  
21 CAA and the Arizona SIP by commencing construction of a major modification  
22 project at AOP-4 without having undergone a Prevention of Significant  
23 Deterioration ("PSD") review by the Arizona Department of Environmental  
24 Quality ("ADEQ"), the appropriate permitting authority under the Arizona SIP, in  
25 order to obtain a permit;  
26  
27  
28

1 WHEREAS, the United States also alleges that ANP failed to comply with  
2 ongoing requirements for emissions reporting, in violation of federal regulations  
3 promulgated under Section 111 of the CAA, 42 U.S.C. § 7411, dealing with New  
4 Source Performance Standards (the "NSPS program"), specifically 40 CFR Part 60  
5 Subpart G (the "Applicable NSPS");  
6  
7

8 WHEREAS, ANP performed an evaluation of the installation and operation  
9 of Selective Catalytic Reduction ("SCR") as a NO<sub>x</sub> abatement ("DeNO<sub>x</sub>") system  
10 for AOP-4 and concluded that the additional back pressure could result in  
11 catastrophic failure of AOP-4's turbine;  
12  
13

14 WHEREAS, the parties have agreed that ANP will enter into a contract with  
15 Thyssenkrupp Industrial Solutions (USA), Inc. ("TKI") to conduct an Alternative  
16 NO<sub>x</sub> Reduction Technical Feasibility Study on AOP-4 as described in Appendix A  
17 to this Consent Decree to provide information on the technical feasibility and the  
18 associated risks on process and equipment reliability of NO<sub>x</sub> abatement  
19 alternatives for AOP-4;  
20  
21

22 WHEREAS, the parties have agreed that ANP will enter into a contract with  
23 TKI within thirty (30) days of the Effective Date, under which TKI will develop a  
24 working process simulation model for the AOP-4 process, identifying additional  
25 locations for sampling points and instrumentation necessary to refine the  
26 simulation;  
27  
28

1 WHEREAS, the parties have agreed that the contract will require TKI to  
2 provide this feedback to ANP such that ANP can install the appropriate monitoring  
3 equipment and provide necessary information to complete the study;  
4

5 WHEREAS, the parties have agreed that the contract will require TKI to  
6 evaluate two SCR control technologies for suitability and utilize the process  
7 simulation model to simulate addition of such potential DeNO<sub>x</sub> technologies to  
8 determine viability;  
9  
10

11 WHEREAS, the parties have agreed that the contract will require TKI to  
12 develop a budgetary design and proposal for the appropriate alternative DeNO<sub>x</sub>  
13 system, including budgetary cost estimate and to evaluate the installation of a pre  
14 and post expander as well as the potential for use of a bypass stack;  
15  
16

17 WHEREAS, the parties have agreed that the contract will require TKI to  
18 develop an AOP-4 Study Report on the technical feasibility and the associated  
19 risks on process and equipment reliability of the NO<sub>x</sub> abatement alternatives;  
20

21 WHEREAS, the parties have agreed that ANP shall include the AOP-4  
22 Study Report as part of an AOP-4 Best Available Control Technology (“BACT”)  
23 Analysis, which shall be included as part of an application to ADEQ requesting an  
24 AOP-4 BACT Determination;  
25

26 WHEREAS, the parties have agreed that in the event ADEQ’s determination  
27 identifies an appropriate alternative NO<sub>x</sub> control technology for AOP-4, ANP shall  
28

1 submit an application to ADEQ requesting authorization to install and operate such  
2 control technology to continue operation of AOP-4;  
3

4 WHEREAS, ANP does not admit any liability arising out of the acts or  
5 omissions alleged in the Complaint or in this Consent Decree;  
6

7 WHEREAS, the Parties agree that the United States' filing of the Complaint  
8 and entry into this Consent Decree constitute diligent prosecution by the United  
9 States, under Section 304(b)(1)(B) of the CAA, 42 U.S.C. § 7604(b)(1)(B), of all  
10 matters alleged in the Complaint and addressed by this Consent Decree through the  
11 date of lodging of this Consent Decree;  
12

13 WHEREAS, the Parties have agreed that settlement of the civil claims  
14 alleged in the Complaint is in the public interest and that entry of this Consent  
15 Decree without further litigation is the most appropriate way to resolve the  
16 allegations in the Complaint;  
17

18 NOW, THEREFORE, IT IS ORDERED, ADJUDGED, AND DECREED as  
19 follows:  
20

21  
22 **I. JURISDICTION, VENUE AND PARTIES BOUND**  
23

24 1. This Court has jurisdiction over the subject matter of this action and the  
25 Parties pursuant to 28 U.S.C. §§ 1331, 1345, 1355, and 42 U.S.C. § 7413(b).  
26

27 2. Venue is proper in the District of Arizona pursuant to  
28 28 U.S.C. §§ 1391(b) and 1395 and 42 U.S.C. § 7413(b).

1 3. Notice of the commencement of this action has been given to the State of  
2 Arizona.

3  
4 4. ANP consents to and shall not challenge entry of this Consent Decree nor  
5 shall ANP challenge this Court's jurisdiction to enter, enforce, modify, or terminate  
6 this Consent Decree.  
7

8 5. This Consent Decree shall apply to and be binding upon ANP and its  
9 successors, and assigns, and upon the United States.  
10

11 6. If ANP conveys the ANP facility or transfers a lease interest in the ANP  
12 facility to a third-party, or if ANP contracts with a third-party to operate all or part  
13 of the ANP facility on ANP's behalf, ANP shall give written notice of this Consent  
14 Decree to any successor in interest or any contract operator before executing such  
15 conveyance or contract. ANP shall send a copy of such written notification to the  
16 United States prior to the closing of such conveyance, transfer or operator  
17 agreement, and ANP shall attach a copy of this Consent Decree to any final  
18 agreement executed with such third-party. Transfer of ANP's ownership of the  
19 ANP facility or its lease interest in the ANP facility, or any contract with a  
20 third-party, will not relieve ANP from any obligation in the Consent Decree, or the  
21 payment of civil or stipulated penalties required under this Consent Decree.  
22  
23  
24  
25  
26

## 27 II. DEFINITIONS

28 7. Unless otherwise expressly provided herein, terms used in this Consent

1 Decree that are defined in the CAA and in regulations promulgated thereunder  
2 shall have the meaning assigned to them in the statutes or in such regulations.  
3

4 Whenever terms listed below are used in this Consent Decree or in the Appendices  
5 attached hereto and incorporated hereunder, the following definitions shall apply:  
6

7 a. "Alternative NO<sub>x</sub> Reduction Technical Feasibility Study on AOP-  
8 4" or "AOP-4 Study" shall mean the study described in Appendix A, which is a  
9 proposal by TKI to ANP detailing the terms and conditions of the study. The  
10 reference in Appendix A, Section 2.2., to EPA's proposed SCR control strategy  
11 means the strategy entitled "Proposed Design and Location of SCR" dated April  
12 21, 2017 detailed in Appendix B to this Consent Decree.  
13  
14

15 b. "AOP-4 Study Report" shall mean the report generated by the  
16 contractor performing the AOP-4 Study that describes the results of the AOP-4  
17 Study on the technical feasibility and the associated risks on process and  
18 equipment reliability of the NO<sub>x</sub> abatement alternatives, including the NO<sub>x</sub>  
19 control strategy described in Appendix B.  
20  
21

22 c. "ANP facility" shall mean the nitric acid plant owned and  
23 operated by Apache Nitrogen Products, Inc., near Saint David, Arizona.  
24

25 d. "AOP-4" shall mean the dual pressure nitric acid production plant  
26 at the ANP facility.  
27

28 e. "ADEQ" shall mean the Arizona Department of Environmental



1 Quality.

2  
3 f. "AOP-4 BACT Analysis" shall mean an analysis prepared by  
4 ANP to identify and assess alternative NO<sub>x</sub> control technologies for AOP-4. Any  
5 such analysis shall consider technical feasibility; energy, environmental, and  
6 economic impacts; and other costs consistent with Chapter B of EPA's "New  
7 Source Review Workshop Manual—Prevention of Significant Deterioration and  
8 Nonattainment Area Permitting," (Draft October 1990) (hereinafter "EPA NSR  
9 Manual"), but shall not include any other elements of PSD permitting  
10 (notwithstanding any reference in Chapter B). The analysis shall, at a minimum,  
11 include evaluation of the alternative NO<sub>x</sub> control technologies considered in the  
12 AOP-4 Study as described in Appendix A to this Consent Decree.  
13  
14  
15  
16

17 g. "AOP-4 "BACT Determination" shall mean the conclusion  
18 reached by ADEQ after reviewing ANP's AOP-4 BACT Analysis, including the  
19 identification of an appropriate alternative NO<sub>x</sub> control technology, if any, for  
20 installation and operation at AOP-4. Such determination shall be based on  
21 consideration of technical feasibility; energy, environmental, and economic  
22 impacts; and other costs consistent with Chapter B of EPA's NSR Manual, but  
23 shall not include any other elements of PSD permitting (notwithstanding any  
24 reference in Chapter B); and any other information ADEQ believes is appropriate.  
25  
26  
27  
28 Such determination shall become final for purposes of this Consent Decree upon

1 ANP's exhaustion of any right to administrative or judicial review of the final  
2 decision under Arizona law. For purposes of the BACT Determination and the  
3 determination of any emissions limit for AOP-4, the applicable NSPS shall be 40  
4 CFR Part 60 Subpart G.  
5

6  
7 h. "CAA" shall mean the Clean Air Act, as amended, 42 U.S.C.  
8 § 7401 *et seq.*  
9

10 i. "Consent Decree" shall mean this Decree and any appendices  
11 attached hereto. In the event of conflict between this Decree and the Appendices,  
12 this Decree shall control, except as to the details of the AOP-4 Study.  
13

14 j. The term "day" shall mean a calendar day unless expressly stated  
15 to be a working day.  
16

17 k. "Effective Date" shall be the date of entry of this Consent Decree  
18 by the Court.  
19

20 l. "EPA" shall mean the United States Environmental Protection  
21 Agency and any successor departments or agencies of the United States.  
22

23 m. "Force majeure" shall mean any event that arises from causes  
24 beyond the control of ANP, of any of ANP's agents, contractors, consultants or  
25 any other entity within the control of ANP that delays or prevents the performance  
26 of any obligation under this Consent Decree despite ANP's best efforts to fulfill  
27 the obligation. "Best efforts" includes anticipating any potential force majeure  
28

1 event and addressing the effects of any such event (a) as it is occurring and  
2 (b) after it has occurred, to prevent or minimize any resulting delay to the greatest  
3 extent possible. "Force Majeure" does not include ANP's financial inability to  
4 perform any obligation under this Consent Decree.  
5  
6

7 n. "Interest" shall mean the statutory rate applicable to judgments, 28  
8 U.S.C. § 1961.  
9

10 o. "NO<sub>x</sub>" shall mean all oxides of nitrogen except nitrous oxide  
11 ("N<sub>2</sub>O").  
12

13 p. "Paragraph" shall mean a portion of this Consent Decree  
14 identified by an Arabic numeral.  
15

16 q. "Parties" shall mean the United States and ANP.  
17

18 r. "Plaintiff" shall mean the United States.  
19

20 s. "Replacement Contractor" shall mean the contractor selected by  
21 ANP and approved by EPA to complete the AOP-4 Study and AOP-4 Study  
22 Report if the previously approved contractor cannot or will not perform the work  
23 for any reason within the required deadline.  
24

25 t. "Section" shall mean a portion of this Consent Decree identified  
26 by a roman numeral.  
27

28 u. "SCR" shall mean selective catalytic reduction, which is a type of  
air pollution control technology that reduces emissions of NO<sub>x</sub>.

1 v. "SIP" shall mean the Arizona State Implementation Plan as  
2 approved by EPA under the Clean Air Act.  
3

4 w. "United States" shall mean the United States of America,  
5 including all of its departments, agencies, and instrumentalities, which includes  
6 without limitation EPA, the Settling Federal Agencies and any federal natural  
7 resources trustee.  
8

9  
10 x. "Working day" shall mean a day other than a Saturday, Sunday, or  
11 Federal holiday. In computing any period of time under this Consent Decree,  
12 where the last day would fall on a Saturday, Sunday, or Federal holiday, the  
13 period shall run until the close of business of the next working day.  
14

15 III. INJUNCTIVE RELIEF  
16

17 8. Within thirty (30) days of the Effective Date, ANP shall enter into a  
18 contract with TKI to commence and complete performance of the AOP-4 Study,  
19 and to provide an AOP-4 Study Report to ANP and EPA, within eighteen (18)  
20 months of the Effective Date. ANP shall use best efforts to provide information  
21 described in Appendix A that is necessary for TKI to complete the AOP-4 Study,  
22 and to enforce its contractual rights to ensure the vendor completes the AOP-4  
23 Study as described in Appendix A. In the event ANP determines that TKI cannot  
24 or will not perform the AOP-4 Study as described in Appendix A, ANP shall  
25 provide notice to EPA of that determination in the progress reports required by  
26  
27  
28

1 Section V and shall select a Replacement Contractor to perform a comparable  
2 study. Upon EPA's approval of the Replacement Contractor, ANP shall enter into  
3 a contract with Replacement Contractor to complete the comparable study and  
4 associated report within eighteen (18) months of EPA's approval.  
5

6  
7 9. Within ninety (90) days of receipt of the AOP-4 Study Report (or report  
8 for any comparable study approved by EPA), ANP shall submit an application to  
9 ADEQ requesting an AOP-4 BACT Determination. ANP's application shall, at a  
10 minimum include an AOP-4 BACT Analysis; a copy of the AOP-4 Study Report  
11 (or report for any comparable study approved by EPA); a copy of this Consent  
12 Decree, including appendices; and a copy of the Complaint filed in this matter.  
13  
14

15 10. Within 180 days of a final AOP-4 BACT Determination that identifies  
16 an appropriate alternative NO<sub>x</sub> control technology for AOP-4, ANP shall submit a  
17 permit revision application to ADEQ requesting authorization to install and operate  
18 such control technology to continue operation of AOP-4. The permit revision  
19 application shall be in the format specified by ADEQ and shall request a  
20 continuously achievable emissions limit consistent with the final AOP-4 BACT  
21 Determination. ANP shall then install and operate any such alternative NO<sub>x</sub>  
22 control technology for AOP-4 according to the terms of the permit revision issued  
23 by ADEQ.  
24  
25  
26  
27  
28

IV. CIVIL PENALTY

1  
2  
3 11. Within thirty (30) days after the Effective Date of this Consent Decree,  
4 or twenty (20) days after receiving payment instructions as described in Paragraph  
5 12, whichever is later, ANP shall pay a civil penalty of six hundred thousand  
6 dollars (\$600,000) to the United States. If payment is not made within the due  
7 date, in addition to the civil penalty, ANP shall pay Interest accruing as of the due  
8 date through the date of payment.  
9  
10

11 12. Payments under this Consent Decree to the United States shall be made  
12 by Electronic Fund Transfer ("EFT") to the U.S. Treasury according to current  
13 United States EFT procedures. Following the Effective Date of the Consent  
14 Decree, current EFT procedures shall be provided to ANP by the Financial  
15 Litigation Unit of the U.S. Attorney's Office for the District of Arizona.  
16  
17 Concurrently with the EFT, ANP shall fax notice of payment to the person  
18 designated as "Point of Contact" on the EFT transfer instructions, and shall send  
19 notice of payment to EPA and the United States Department of Justice ("DOJ") at  
20 the addresses listed in Section XI (Notification) of this Consent Decree. The  
21 notice of payment shall identify: (1) the date and amount of money transferred;  
22 (2) the name and address of the transferring bank; (3) this case by name; (4) the  
23 civil action number; (5) DOJ # 90-5-2-1-10736; (6) this Consent Decree (including  
24 the Effective Date); and (7) a description of the reason for the payment (including  
25  
26  
27  
28

1 the paragraph number of this Consent Decree that is most relevant to the payment).

2  
3 V. PERIODIC REPORTING

4 13. Beginning thirty (30) days after the end of the second full calendar  
5 quarter following the entry of this Consent Decree, and continuing on a semi-  
6 annual basis until termination of this Consent Decree, and in addition to any other  
7 express reporting requirement in this Consent Decree, ANP shall submit to EPA a  
8 progress report. The progress report shall contain the following information:  
9  
10

11 a. all requested information necessary to determine compliance  
12 with this Consent Decree; and  
13

14 b. all information indicating the status of the AOP-4 Study and  
15 Study Report, any delay or anticipated delay in completing the AOP-4 Study or the  
16 Study Report, and the steps taken by ANP to mitigate such delay.  
17

18 14. In addition to the progress reports required pursuant to this Section,  
19 ANP shall provide a written report to Plaintiff of any violation of the requirements  
20 of this Consent Decree within fifteen (15) calendar days of when ANP knew or  
21 should have known of any such violation. In this report, ANP shall explain the  
22 cause or causes of the violation and all measures taken or to be taken by ANP to  
23 prevent such violations in the future.  
24  
25

26 15. Each ANP report shall be signed by a corporate official with  
27 management responsibility for the subject matter of the notice or report, and shall  
28

1 contain the following certification:  
2

3 This information was prepared either by me or under my direction or  
4 supervision in accordance with a system designed to assure that  
5 qualified personnel properly gather and evaluate the information  
6 submitted. Based on my evaluation, or the direction and my inquiry  
7 of the person(s) who manage the system, or the person(s) directly  
8 responsible for gathering the information, I hereby certify under  
9 penalty of law that, to the best of my knowledge and belief, this  
10 information is true, accurate, and complete. I understand that there  
11 are significant penalties for submitting false, inaccurate, or incomplete  
12 information to the United States.

#### 13 VI. REVIEW OF SUBMITTALS

14 16. ANP shall submit each air quality-related permit application, plan,  
15 report, or other submission required by this Consent Decree to EPA, whenever  
16 such a document is required pursuant to this Consent Decree.

#### 17 VII. STIPULATED PENALTIES

18 17. Subject to the Force Majeure provisions of this Consent Decree, ANP  
19 shall be liable for stipulated penalties for failure to comply with the terms and  
20 conditions of this Consent Decree of \$1,000 per day per violation for the first thirty  
21 (30) days and \$2,500 per day per violation for the thirty first (31<sup>st</sup>) day and beyond.

22 18. Penalties shall begin to accrue on the day after performance is due or on  
23 the day a violation occurs, whichever is applicable, and shall continue to accrue  
24 until performance is satisfactorily completed or until the violation ceases.

25 Stipulated Penalties shall accrue simultaneously for separate violations of this  
26 Consent Decree. Any stipulated penalty accruing pursuant to this Consent Decree  
27  
28



1 shall be payable upon demand and due not later than thirty (30) days after ANP's  
2 receipt of EPA's written demand. Such demand shall be sent by certified mail.  
3

4 19. If ANP disputes the claimed violation, ANP may initiate the dispute  
5 resolution procedures set forth in this Consent Decree. Otherwise, ANP shall pay  
6 the Stipulated Penalties. Subject to the Dispute Resolution procedures set forth in  
7 this Consent Decree, Interest shall accrue on unpaid Stipulated Penalties that are  
8 due and owing thirty (30) days after ANP's receipt of EPA's written demand.  
9  
10

11 Stipulated penalties shall be paid in the same manner as payment of a civil penalty.  
12

13 20. Payment of stipulated penalties for a violation of this Consent Decree  
14 shall be in addition to the right of the United States to seek other judicial or  
15 administrative relief for the violations that led to stipulated penalties. In assessing  
16 penalties during any proceeding for other judicial or administrative relief, a court  
17 or the United States may consider any payment of stipulated penalties already  
18 made by ANP. In addition, the United States reserves its right to pursue any or all  
19 relief for any or all violations outside the purview of this Consent Decree.  
20  
21

22 21. The United States may, in the unreviewable exercise of its discretion,  
23 reduce or waive Stipulated Penalties otherwise due under this Consent Decree.  
24

25 22. In the case of Dispute Resolution of Stipulated Penalties, the Stipulated  
26 Penalties need not be paid until the following:  
27

28 a. If the dispute is resolved by agreement or by a decision of EPA that is

1 not appealed to the Court, ANP shall pay accrued penalties determined to be  
2 owing, together with Interest, within thirty (30) days of the effective date of the  
3 agreement or the receipt of EPA's decision or order.  
4

5         b. If the dispute is appealed to the Court and the United States prevails in  
6 whole or in part, ANP shall pay all accrued penalties determined by the Court to be  
7 owing, together with Interest, within sixty (60) days of receiving the Court's  
8 decision or order, except as provided in Subparagraph c, below.  
9  
10

11         c. If any Party appeals the District Court's decision, ANP shall pay any  
12 and all accrued penalties determined to be owed, together with Interest, within  
13 fifteen (15) days of receiving the final appellate court decision requiring payment  
14 of stipulated penalties.  
15

#### 16 17 VIII. RIGHT OF ENTRY

18         23. EPA and its respective contractors, consultants, and agents shall have  
19 authority to inspect ANP's facility at all reasonable times, upon proper presentation  
20 of credentials. This provision does not apply to areas not owned or under the  
21 control of ANP. In addition, this provision in no way limits or otherwise affects  
22 any right of entry held by EPA pursuant to applicable federal, state, or local laws,  
23 regulations, or permits.  
24  
25

#### 26 27 IX. FORCE MAJEURE

28         24. ANP shall satisfy the requirements of any injunctive relief except to the

1 extent, and for the period of time, that such performance is prevented or delayed by  
2 events which constitute a force majeure, as defined above in Section II  
3 (Definitions).  
4

5         25. When a force majeure event occurs, the time for performance of the  
6 activity delayed by the force majeure shall be extended for the time period of the  
7 delay attributable to the force majeure. The time for performance of any activity  
8 dependent on the delayed activity shall be similarly extended, except to the extent  
9 that the dependent activity can be implemented in a shorter time. The United  
10 States, through EPA, shall determine whether dependent activities will be delayed  
11 by the force majeure and whether the time period should be extended for  
12 performance of such activities. ANP shall adopt all reasonable measures to avoid  
13 or minimize any delay caused by a force majeure.  
14  
15  
16  
17

18         26. When an event occurs or has occurred that may delay or prevent the  
19 performance of any obligation under this Consent Decree, ANP shall provide  
20 written notification to the Chief, Air & TRI Section, Enforcement Division of  
21 EPA, Region 9, within twenty (20) days of ANP's knowledge of such event. The  
22 written notification shall fully describe: the event that may delay or prevent  
23 performance; reasons for the delay; whether ANP claims that the delay resulted  
24 from an event which qualifies as a force majeure; the reasons any such delay is  
25 beyond the reasonable control of ANP; the anticipated duration of the delay;  
26  
27  
28

1 actions taken or to be taken to prevent or minimize the delay; a schedule for  
2 implementation of any measures to be taken to mitigate the effect of the delay; and  
3 the time needed to implement any dependent activities. For purposes of this  
4 Section, ANP will be deemed to have known of any circumstance that any of  
5 ANP's agents, contractors, consultants, or any other entity within the control of  
6 ANP, knew or should have known.  
7  
8

9  
10 27. ANP's failure to comply with the force majeure notice requirements  
11 provided herein for any delay in performance will be deemed an automatic  
12 forfeiture of its right to assert that the delay was caused by a force majeure.  
13

14 28. After receiving notice from ANP of a force majeure, the United States,  
15 through EPA, shall provide written notification to ANP stating whether it agrees  
16 that there was a force majeure event and whether ANP's request for a delay is  
17 justified. If the United States does not respond to a request for a delay within thirty  
18 (30) days, the failure to respond may be treated by ANP as a denial of the request.  
19 If ANP disagrees with the United States' force majeure determination, ANP may  
20 initiate dispute resolution as set forth in this Consent Decree.  
21  
22  
23

#### 24 X. DISPUTE RESOLUTION

25 29. Unless otherwise expressly provided for in this Consent Decree, the  
26 Dispute Resolution procedures of this Section shall be the exclusive mechanism to  
27 resolve disputes arising under or with respect to this Consent Decree. With respect  
28

1 to any dispute or allegation expressly raised by the United States concerning  
2 ANP's compliance with the Consent Decree, ANP's failure to seek resolution of a  
3 dispute under this Section shall preclude ANP from raising any such issue as a  
4 defense to an action by the United States to enforce any obligation of ANP arising  
5 under this Consent Decree.  
6  
7

8       30. Informal Dispute Resolution. Any dispute subject to Dispute  
9 Resolution under this Consent Decree shall first be the subject of informal  
10 negotiations. The dispute shall be considered to have arisen when a written Notice  
11 of Dispute is sent by ANP. Such Notice of Dispute shall state clearly the matter in  
12 dispute. The period of informal negotiations shall not exceed thirty (30) days from  
13 the date the dispute arises, unless that period is modified by written agreement. If  
14 the Parties cannot resolve a dispute by informal negotiations, then the position  
15 advanced by the United States shall be considered binding unless, within thirty  
16 (30) days after the conclusion of the informal negotiation period, ANP invokes  
17 formal Dispute Resolution procedures as set forth below.  
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22       31. Formal Dispute Resolution. ANP shall invoke formal Dispute  
23 Resolution procedures, within the time period provided in the preceding Paragraph,  
24 by serving on the United States a written Statement of Position regarding the  
25 matter in dispute. The Statement of Position shall include, but may not necessarily  
26 be limited to, any factual data, analysis, or opinion supporting ANP's position and  
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1 any supporting documentation relied upon by ANP.

2  
3 32. The United States shall serve its Statement of Position within forty-five  
4 (45) days of receipt of ANP's Statement of Position. The Statement of Position of  
5 the United States shall include, but may not necessarily be limited to, any factual  
6 data, analysis, or opinion supporting that position and any supporting  
7 documentation relied upon by the United States. The United States' Statement of  
8 Position shall be binding on ANP, unless ANP files a motion for judicial review of  
9 the dispute in accordance with the following Paragraph.  
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12  
13 33. ANP may seek judicial review of the dispute by filing with the Court  
14 and serving on the United States, in accordance with the Notice provisions of this  
15 Consent Decree, a motion requesting judicial resolution of the dispute. The motion  
16 must be filed within thirty (30) days of receipt of the United States' Statement of  
17 Position pursuant to the preceding Paragraph. The motion shall contain a written  
18 statement of ANP's position on the matter in dispute, including any supporting  
19 factual data, analysis, opinion, or documentation, and shall set forth the relief  
20 requested and any schedule within which the dispute must be resolved for orderly  
21 implementation of the Consent Decree.  
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25 34. The United States shall respond to ANP's motion within the time period  
26 allowed by the Local Rules of this Court. ANP may file a reply memorandum, to  
27 the extent permitted by the Local Rules.  
28

1 35. In any dispute ANP shall bear the burden of demonstrating that its  
2 position complies with this Consent Decree and that ANP is entitled to relief under  
3 applicable law. The United States reserves the right to argue that its position is  
4 reviewable only on the administrative record and must be upheld unless arbitrary  
5 and capricious or otherwise not in accordance with law. If the United States  
6 invokes this right, the United States shall compile an administrative record of the  
7 dispute containing all Statements of Position, including supporting documentation  
8 and referenced data or information, and ANP shall have the burden of  
9 demonstrating, based on the administrative record, that the position of the United  
10 States is arbitrary and capricious or otherwise not in accordance with law.  
11

12 36. The invocation of Dispute Resolution procedures under this Section  
13 shall not, by itself, extend, postpone, or affect in any way any obligation of ANP  
14 under this Consent Decree, unless and until the Court so orders. Stipulated  
15 Penalties with respect to the disputed matter shall continue to accrue from the first  
16 day of noncompliance, but payment shall be stayed pending resolution of the  
17 dispute. If ANP does not prevail on the disputed issue, Stipulated Penalties shall  
18 be assessed and paid as provided in this Consent Decree.  
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#### 25 XI. NOTIFICATION

26 37. Except as otherwise specifically stated herein, all notices and  
27 submissions required by this Consent Decree shall be sent by certified mail,  
28

1 express mail, or similar overnight mail delivery service with return receipt  
2 requested.  
3

4 38. All notices and reports by ANP shall be signed and affirmed by a  
5 corporate official with management responsibility for the subject matter of the  
6 notice or report, using the following certification:  
7

8 I certify that this information was prepared under my direction  
9 or supervision in accordance with a system designed to assure  
10 that qualified personnel properly gather and evaluate the  
11 information to be submitted. Based on my directions and my  
12 inquiry of those individuals immediately responsible for  
13 obtaining the information to be submitted, I certify that the  
14 information is true, accurate, and complete to the best of my  
15 knowledge, information, and belief. I am aware that there are  
16 significant penalties for submitting false information, including  
17 the possibility of fines and imprisonment.

18 All notices and reports submitted to EPA or DOJ shall refer to this Consent  
19 Decree and the date of entry of the Consent Decree, and shall cite the case name of  
20 *United States v. Apache Nitrogen Products, Inc.*, the case number, and DOJ # 90-  
21 5-2-1-10736.

22 39. Notices and reports to the United States as required by this Consent  
23 Decree shall be submitted to:  
24  
25 if by regular mail or post office express mail:

26 Chief, Environmental Enforcement Section  
27 Environment & Natural Resources Division  
28 United States Department of Justice  
P.O. Box 7611



1 Washington, D.C. 20044 7611

2  
3 if by private overnight mail service:

4  
5 Chief, Environmental Enforcement Section  
6 Environment & Natural Resources Division  
7 United States Department of Justice  
8 601 D St. NW  
9 Washington, D.C. 20005

10 and to:

11 Allan Zabel (ORC-2)  
12 U.S. Environmental Protection Agency  
13 75 Hawthorne Street  
14 San Francisco, CA 94105

15 Director, Enforcement Division  
16 U.S. Environmental Protection Agency  
17 75 Hawthorne Street  
18 San Francisco, CA 94105  
19 Attn: Charles Aldred (ENF 2-1)

20 Director, Air Enforcement Division  
21 U.S. Environmental Protection Agency  
22 1200 Pennsylvania Avenue, NW  
23 Mail Code: 2242A  
24 Washington, DC 20460

25 Notices to ANP as required by this Consent Decree shall be submitted to:

26 Jeremy Barrett  
27 President & General Manager  
28 Apache Nitrogen Products, Inc.  
1436 S. Apache Powder Rd.,  
St. David, AZ 85630  
Mail: P.O. Box 700, Benson, AZ 85602  
JBarrett@apachenitro.com

1  
2 and to:

3 Chris Leason  
4 Gallagher & Kennedy, PA  
5 2575 East Camelback Road  
6 Suite 1100  
7 Phoenix, AZ 85016  
8 chris.leason@gknet.com

9 XII. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

10 40. Entry of this Consent Decree and compliance with the requirements  
11 herein shall resolve and shall be in full settlement and satisfaction of the civil  
12 claims of the United States against ANP as alleged in the Finding and Notice of  
13 Violation, dated July 23, 2012, and the Complaint concurrently filed in this action  
14 through the lodging of this Consent Decree.  
15  
16

17 41. Except as specifically provided herein, the United States does not waive  
18 any rights or remedies available to it for violation by ANP of federal or state laws  
19 or regulations. This Consent Decree shall in no way affect the United States'  
20 ability to bring future actions for any claims not alleged in the Complaint or the  
21 Finding and Notice of Violation, dated July 23, 2012, in this case or for claims  
22 subject to an express reservation. This Consent Decree does not relieve ANP of  
23 any criminal liability.  
24  
25  
26

27 42. This Consent Decree in no way affects ANP's responsibilities to comply  
28 with all federal, state, or local laws and regulations.

1 43. This Consent Decree does not limit or affect the rights of ANP or of the  
2 United States against any third parties, not party to this Consent Decree, nor does it  
3 limit the rights of third parties, not parties to this Consent Decree, against ANP,  
4 except as otherwise provided by law. This Consent Decree shall not be construed  
5 to create rights in, or grant any cause of action to, any third party not party to this  
6 Consent Decree.  
7  
8

9  
10 XIII. COSTS

11 44. The Parties shall bear their own costs of this action, including attorneys'  
12 fees.  
13

14 XIV. TERMINATION

15 45. This Consent Decree shall terminate after ANP has completed and  
16 satisfied all of the following requirements of this Consent Decree and the  
17 termination procedure set forth below:  
18

- 19 a. completion of the injunctive relief specified in this Consent Decree;  
20  
21 and  
22 b. payment of all penalties and other monetary obligations due under the  
23 terms of this Consent Decree.  
24

25 46. If ANP believes that it has satisfied the requirements for termination set  
26 forth above, ANP shall certify such compliance and completion to the United  
27 States in writing. Unless, within sixty (60) days of receipt of ANP's certification,  
28

1 the United States objects in writing with specific reasons, the Court may upon  
2 motion by ANP order that this Consent Decree be terminated. If the United States  
3 objects to the certification by ANP, then the matter shall be submitted to the Court  
4 for resolution under the dispute resolution provisions of this Consent Decree. In  
5 such case, ANP shall bear the burden of proving that this Consent Decree should  
6 be terminated.  
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10 XV. MISCELLANEOUS

11 47. The terms of this Consent Decree may be modified only by a  
12 subsequent written agreement signed by the United States and Defendants. Where  
13 the modification constitutes a material change to any term of this Consent Decree,  
14 it shall be effective only upon approval by the Court.  
15

16 48. The Effective Date of this Consent Decree shall be the date upon which  
17 this Consent Decree is entered by the Court.  
18

19 49. The Court shall retain jurisdiction over this case until termination of this  
20 Consent Decree, for the purpose of resolving disputes arising under this Consent  
21 Decree or entering orders modifying this Consent Decree or effectuating or  
22 enforcing compliance with the terms of this Consent Decree.  
23

24 50. The Parties represent that each undersigned signatory signing on their  
25 behalf has full authority to sign the Consent Decree and to bind said party to the  
26 terms and conditions of the Consent Decree.  
27  
28

1           51. ANP agrees and acknowledges that final approval of this Consent  
2 Decree by the United States and entry of this Consent Decree is subject to the  
3 requirements of 28 C.F.R. § 50.7, which provides for notice of the lodging of this  
4 Consent Decree in the Federal Register, opportunity for public comment for at  
5 least thirty (30) days, and consideration of any comments prior to entry of the  
6 Consent Decree by the Court. The United States reserves the right to withdraw  
7 consent to this Consent Decree based on comments received during the public  
8 notice period. ANP consents to entry of this Consent Decree without further notice  
9 to the Court. Upon approval and entry, this Consent Decree shall constitute a final  
10 judgment under Rules 54 and 58 of the Federal Rules of Civil Procedure.  
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1 IT IS SO ORDERED

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3 DATED this \_\_\_\_\_ day of \_\_\_\_\_, 2017.

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7 UNITED STATES DISTRICT JUDGE  
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1 Signature page for *Consent Decree in United States v. Apache Nitrogen Products, Inc.*

2 FOR THE PLAINTIFF UNITED STATES OF AMERICA:  
3

4  
5 DATE: 12/19



6 ELLEN M. MAHAN  
7 Deputy Section Chief  
8 Environmental Enforcement Section  
9 Environment & Natural Resources Division  
10 United States Department of Justice

11 DATE: 12/19



12 JAMES R. MacAYEAL  
13 Senior Counsel  
14 Environmental Enforcement Section  
15 Environment & Natural Resources Division  
16 United States Department of Justice  
17 P.O. Box 7611  
18 Washington, D.C. 20044-7611  
19  
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1 Signature page for *Consent Decree in United States v. Apache Nitrogen Products, Inc.*

2  
3 FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

4  
5 Office of Enforcement and Compliance Assurance  
6 United States Environmental Protection Agency

7  
8 DATE: 12/19/17

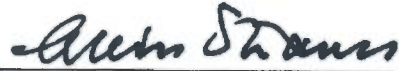
By:

9   
10 SYLVIA QUAST  
11 Regional Counsel  
12 United States Environmental Protection Agency  
13 Region 9  
14 75 Hawthorne Street  
15 San Francisco, CA 94105



1 Signature page for *Consent Decree in United States v. Apache Nitrogen Products, Inc.*

2  
3  
4 DATE: 19 Dec. 2017



ALEXIS STRAUSS  
Acting Regional Administrator  
United States Environmental Protection Agency  
Region 9

5  
6  
7  
8  
9  
10 Of Counsel:

11 ALLAN ZABEL

12 Office of Regional Counsel (ORC-2)

13 United States Environmental Protection Agency Region 9

14 75 Hawthorne Street

15 San Francisco, CA 94105

1 Signature page for *Consent Decree in United States v. Apache Nitrogen Products, Inc.*

2  
3 FOR THE DEFENDANT APACHE NITROGEN PRODUCTS, INC.:

4  
5  
6  
7 DATE: August 1, 2017



8 Name: Jeremy R. Barrett

9 Title: President and General Manager

Appendix A to Consent Decree

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thyssenkrupp Industrial Solutions (USA), Inc.  
6400 S. Fiddler's Green Circle, Suite 700  
Greenwood Village, CO 80111



## Proposal for Nitric Acid Plant Simulation and DeNO<sub>x</sub> Budget

Presented to Apache Nitrogen Products Inc.

Prepared by thyssenkrupp Industrial Solutions (USA), Inc.  
Rev. 4– 30 November 2017

thyssenkrupp Industrial Solutions (USA), Inc.  
6400 S. Fiddler's Green Circle, Suite 700  
Greenwood Village, CO 80111



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## 1 Background

Apache Nitrogen Products Inc. (ANPI) operates the dual pressure, Chemico Design AOP4 nitric acid plant in Benson, AZ. This plant was commissioned in the 1970s and includes an extended absorption tower with a chilled water loop. The U.S. Environmental Protection Agency (EPA) and Department of Justice have questioned the feasibility of reducing the nitrogen oxide (NO<sub>x</sub>) emissions of the AOP4 plant. A voluntary Best Available Control Technology (BACT) evaluation was done to evaluate the installation and operation of a NO<sub>x</sub> abatement (DeNO<sub>x</sub>) system and concluded that the additional back pressure may have a detrimental effect on the air compressor set. After deliberations with EPA, it was agreed that a simulation will be conducted to review if a DeNO<sub>x</sub> system can be installed without the risk of damaging the system. If not possible, the limitations need to be identified; if possible, the location and design need to be identified.

thyssenkrupp Industrial Solutions (USA), Inc. (thyssenkrupp) visited the AOP4 plant August 23- 25. While at the site, the thyssenkrupp team observed the plant operation and talked with operators about how the facility operates. The team collected their results in a Visit Report. In addition, on January 24, 2017, ANPI, thyssenkrupp, and EPA's technical expert met to discuss the study and agree upon a path forward.

### 1.1 Project Description

During the January 2017 visit, the group agreed that thyssenkrupp would:

1. Develop a working process simulation model for the AOP4 process. As part of the simulation effort identify, additional locations for sampling points and instrumentation necessary to refine the simulation. thyssenkrupp will provide this feedback to ANPI such that ANPI can install the appropriate equipment and provide necessary information.
2. Evaluate two DeNO<sub>x</sub> technologies for suitability: Uhde DeNO<sub>x</sub> and Uhde EnviNO<sub>x</sub>®
3. Utilize the process simulation model to simulate addition of the potential DeNO<sub>x</sub> technologies to determine viability.
4. Develop a budgetary design and proposal for the appropriate DeNO<sub>x</sub> system, including budgetary cost estimate. Installation pre and post expander as well as the potential for use of a bypass stack will be evaluated.
5. Develop a summary report for ANPI on the technical feasibility and the associated risks on process and equipment reliability of the NO<sub>x</sub> abatement alternatives.

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**thyssenkrupp**

6. Develop a working model and provide support to enable process optimization and continuous improvement initiatives.

This proposal contains a cost estimates for the completion of these two steps executed concurrently.



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## 2 Scope of Work

### 2.1 AOP4 Base Case Simulation

The proposed simulation scope of work for this effort consists of the following activities:

1. Modeling of the AOP4 nitric acid plant utilizing ProSimPlus HNO<sub>3</sub> based on operating data from the AOP4 facility.
2. Verification of the simulation model against different observed operating cases at the AOP4 facility (Gauze Start of Life and End of Life, Compressor Start of Life and End of Life and Turndown).
3. Model report.

#### 2.1.1 Deliverables

The model report consists of the following (for each case):

##### 2.1.1.1 Heat and Material Balance

Heat and material balance for the 5 design cases identified in section 2.1 item 2.

##### 2.1.1.2 Simulation flowsheet

Flowsheet from ProSimPlus HNO<sub>3</sub> simulation indicating all streams and unit ops.

##### 2.1.1.3 Temperature profile

Temperature profile for the five design cases identified in section 2.1 item 2.

##### 2.1.1.4 Pressure profile

Pressure profile for the five design cases identified in section 2.1 item 2.

##### 2.1.1.5 Tail gas composition

Tail gas composition of NO<sub>x</sub> components for the five design cases identified in section 2.1 item 2.

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## 2.2 AOP4 Nitric Acid Plant DeNOx Budgetary Proposal

The DeNOx Budgetary Proposal consists of the following:

1. Preliminary design of an Uhde technology NOx abatement system (Uhde DeNOx or Uhde EnviNOx®) detailed below. (This design will consider potential installation of a NOx abatement system pre and post expander as well as the potential for use of a bypass stack as per EPA request, and described in the document entitled "Proposed Design and Location of SCR," dated April 21, 2017.)
2. Budgetary cost estimate for the engineering and procurement of the NOx abatement system based on the preliminary design.

### 2.2.1 Deliverables

#### 2.2.1.1 Name-Only Equipment List

The preliminary equipment consists of:

- Equipment name and tag
- Preliminary process sizing dimensions
- Preliminary material selection
- Preliminary design conditions

#### 2.2.2 Preliminary Red-line PFDs

The preliminary red-line PFDs consists of:

- Red-line mark-ups of ANPI's existing PFDs indicating tie-point locations for new equipment and piping

#### 2.2.3 Preliminary Emissions Summary

The preliminary emissions summary indicates the anticipated NOx emissions once the DeNOx system is installed.

#### 2.2.4 Preliminary Update Points Updated Plot Plan

The preliminary updated plot plan indicates the location of all tie points.

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## 2.3 AOP4 DeNOx Installation Simulation

Once suitable DeNOx alternatives have been identified, the ProSimPlus HNO<sub>3</sub> simulation will be updated to incorporate the DeNOx system to determine the impact of the DeNOx system installation on the operations of the AOP4 facility. The output of these simulations will be included in the model report.

The AOP4 simulation will only be verified against operating data provided by ANPI during the course of the study. Data collected during this period will not represent all potential operating conditions possible within the facility. Any operation outside of the range of data collected during this project cannot be guaranteed by the simulation. thyssenkrupp will assure that the design of new equipment and systems will contain safeguards to protect equipment and personnel.

### 2.3.1 Deliverables

The model report consists of the following (for each case):

#### 2.3.1.1 Heat and Material Balance

Updated heat and material balance for the five design cases (Gauze Start of Life, End of Life, Compressor Start of Life, End of Life, and Turndown) incorporating the DeNOx system.

#### 2.3.1.2 Simulation flowsheet

Flowsheet from ProSimPlus HNO<sub>3</sub> simulation indicating all streams and unit ops incorporating the DeNOx system.

#### 2.3.1.3 Temperature profile

Temperature profile for the five design cases identified in section 2.1 item 2 incorporating the DeNOx system.

#### 2.3.1.4 Pressure profile

Pressure profile for the five design cases identified in section 2.1 item 2 incorporating the DeNOx system.

#### 2.3.1.5 Tail gas composition

Tail gas composition of NO<sub>x</sub> components for the five design cases identified in section 2.1 item 2 incorporating the DeNOx system.

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### 2.3.2 Submission of Report

The model report will be submitted simultaneously to ANPI and EPA.

## 2.4 ANPI Obligations

thyssenkrupp will provide ANPI with an initial list of operating data points to be collected as the basis of the model. ANPI is responsible to respond to thyssenkrupp with a timeline for collecting this data within five (5) business days of submission. This data will include, but is not limited to:

- Operating temperatures
- Operating pressures
- Operating flowrates
- Nitric Acid yield
- Stream Composition
- PFDs of existing plant
- P&IDs of existing plant
- Layout and arrangement plans of existing plant

Should accurate figure for the data request be unavailable due to limitations within the AOP4 instrumentation system, ANPI is responsible to inform thyssenkrupp within the same time frame so that other provisions may be made. Over the course of the effort, thyssenkrupp may request additional operating data for use in model verification. thyssenkrupp will formally submit a request for additional information, at which point ANPI will have five days to provide the timeline to supply requested operating data.

Upon receipt of data, thyssenkrupp will evaluate data quality for simulation purposes and inform ANPI of status prior to running simulations. If data is not of quality to allow for reasonable simulation, thyssenkrupp will inform ANPI and hold on proceeding with simulation so as not to unnecessarily expend hours trying to verify simulation with poor quality data. It may not be possible to determine data quality prior to simulation efforts with every data set, but thyssenkrupp will endeavor to do so.

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## 2.5 Meetings

During the execution of this effort, thyssenkrupp has not assumed any expenses for in-person meetings requiring travel. Any travel for meetings will be reimbursed at cost + 10%.

## 2.6 Time Schedule

See Attachment 1: Preliminary Time Schedule.

## 2.7 Commercial Terms and Conditions

thyssenkrupp has included a commented, sample "Master Services Agreement" supplied by ANPI that could be utilized as the basis of the agreement if mutually agreed upon. This agreement still requires further internal review by thyssenkrupp. This agreement could also serve as the basis for future work performed by thyssenkrupp for ANPI.

### 2.7.1 Pricing

The pricing of the project consists of two components:

#### 2.7.1.1 DeNOx budgetary proposal price

Assuming that the DeNOx system design utilizes thyssenkrupp standardized proprietary information, the DeNOx budgetary proposal will be performed on a lump-sum basis with price for this effort of:

**USD 15,000.00**  
**(Fifteen Thousand US Dollars)**

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### 2.7.1.2 DeNOx budgetary proposal price

Due to the fact that the simulation work is contingent upon availability and access to information this effort will be performed on a reimbursable basis utilizing the following man-hour rates:

Employee Categorization	Man-hour Rate <sup>1</sup>
Project Management / Senior Engineer	\$165.00/hour <sup>2</sup>
Process Engineering / Cost Control	\$141.00/hour

the estimated price for this effort is:

**USD 94,000.00**  
(Ninety Four Thousand US Dollars)

**Note:**

The price is subject to change based on the actual level of effort required for the completion of the simulation model.)

<sup>1</sup>Man-hour rates valid through 30 September 2018, rates subject to revision 1 October 2018.

<sup>2</sup>This rate is based on the EURO converted into an USD amount at exchange rate of 1.09 USD/EUR using fixed by European Central Bank (ECB). Upon the date of invoicing if the exchange rate published by the European Central Bank (ECB) fluctuates by more than 10% (Ten Percent) either way the rate will be adjusted accordingly. ECB's official website is <http://sdw.ecb.europa.eu/>.

**Total budgetary price of lump sum and reimbursable components:**

**USD 109,000.00**  
(One Hundred Nine Thousand US Dollars)

### 2.7.2 Payment Schedule

The Payment Schedule for the Services described in this Proposal is as follows:

Milestone	Payment
Retainer – Upon contract execution	25% of Total Estimated Price in 2.6.1
At the end of each 4 week period	Billed actual hours x Rate for previous 4 weeks
Delivery of Final Deliverables	Final payment (Actual Hours for previous 4 weeks – Retainer) of Total Price in 2.6.1

\*All invoices are net 30 days from date of invoice

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Greenwood Village, CO 80111



### 2.7.3 Taxes

All taxes are excluded from this Proposal and will be the responsibility of ANPI.

### 2.7.4 Bid Validity

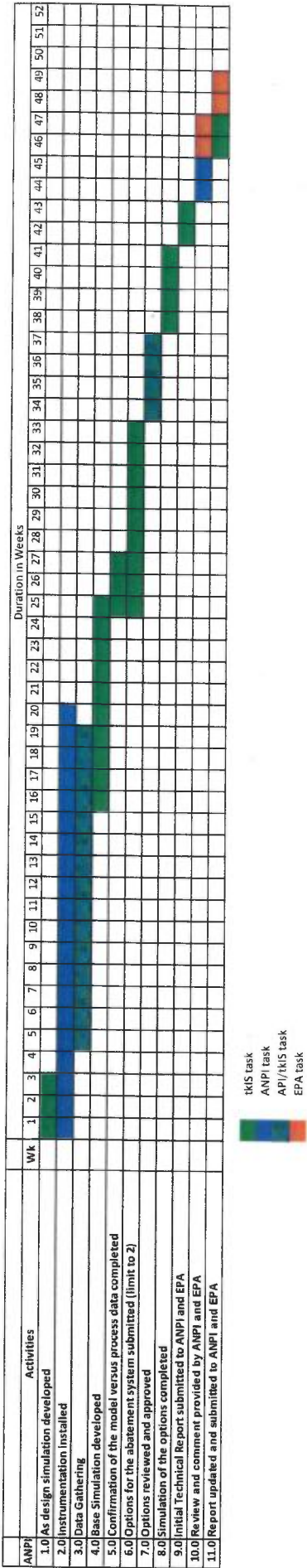
This offer will be valid for acceptance until 28 February 2018.



**thyssenkrupp Industrial Solutions (USA), Inc.**  
 6400 S. Fiddler's Green Circle, Suite 700  
 Greenwood Village, CO 80111

**Attachment 1: Preliminary Time Schedule**

thyssenkrupp and ANPI will use best efforts to adhere to the schedule below





Appendix B to Consent Decree

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**APPENDIX B**  
**Proposed Design and Location of SCR**  
April 21, 2017

The following describes a proposed design and location of a selective catalytic reduction (“SCR”) air pollution control technology for AOP-4 that should be considered for a BACT Determination:

**1. Fan Type:**

There are two types of principally different fan designs available, namely axial fans and centrifugal fans. Axial fans are characterized by the fact that the gas flow is parallel to the direction of the axis of the fan wheel. Axial fans are designed to move large to very large gas volumes most efficiently while overcoming low to only moderate pressure drops. Most commonly known types of axial fans are in-wall mounted exhaust fans in rooms and buildings and inlet fans of jet engines.

Centrifugal or radial fans are characterized by the fact that the gas flow is perpendicular to the direction of the axis of the fan wheel. Centrifugal fans are designed to overcome moderate to high pressure drops while moving smaller to moderately large air volumes only. Centrifugal fans are more commonly used in a very large variety of industrial applications than axial fans with the main reason being their more universal adaptability of all possible gas compositions and their ability to overcome even large pressure drops. Most commonly known types of centrifugal fans include hair dryers, leaf blowers, turbo chargers and others.

One key criterion for the much more universal adaptability of centrifugal fans to all kinds of flow conditions and gas compositions is the fact that the axis of the fan wheel is perpendicular to the gas flow and therefore, contrary to axial fans, a centrifugal fan wheel’s shaft bearings are not within the gas flow itself. This means all bearings and supports for the fan wheel shaft can be accommodated outside of the gas stream to be conveyed and are therefore not subjected to the gas stream’s characteristics. This is particularly advantageous for conveying hot and/or wet and/or corrosive and/or abrasive gas streams. This distinct advantage has led to the development of larger and larger centrifugal fan designs capable of conveying gas volumes of several hundred thousand standard cubic feet per minute (scfm).

In order to prove the easy and general availability of a fan suitable for this application, Howden, one of the world's largest industrial fan suppliers was contacted and asked for a budgetary quotation for a variable frequency drive (VFD) centrifugal fan based on the following flue gas characteristics :

- Flue gas volume flow rate: 28,000 scfm (50,725 acfm @ 500 F)
- Pressure drop to be overcome: 8 inches water gauge
- flue gas temperature: 400 – 500 F
- flue gas composition:
  - NO: up to 250 ppmvd
  - O<sub>2</sub>: 2 – 3 %vol.
  - H<sub>2</sub>O: 0.1 – 2.0 % vol.
  - HCl, SO<sub>2</sub>, SO<sub>3</sub>, PM: traces only
- Elevation of the plant: 3,500 ft above sea level
- Inlet duct diameter: 30 inches, round flange
- Fan housing: carbon steel, vertical upward discharge, rectangular flange
- Design: spark resistant design and construction

Howden responded with the following budgetary quote for a centrifugal ID booster fan for the SCR retrofit.

Please note that this quote is only an example and does not represent an endorsement of this vendor over any other comparable vendor.



Sales Office  
**Howden Covert Fans Inc.**  
 Tel. 716-817-6974

Fax: 716-817-6903

[gbrill@covertfans.com](mailto:gbrill@covertfans.com)

**TO:** E&EC **DATE:** April 15, 2014

**ATT:** Hans Harfenstein **FROM:** Greg Brill  
 Key Account Manager  
 Howden Covert Fans Inc.

**TEL:** 508-615-5499

**CC:** Rick Hach  
 Lisa Kuriz

Number of pages  
 including cover sheet

**REMARKS:**  Via Email  Via Fax

**Ref:** Our: HCVG680036

Sir/Madam,

The following is our proposal for the Booster fan required on your project. Please note the following important points:

**Induced Draft**

- Fan offered is SW81 Arr. 8 (overhung impeller) with common fan and motor base.
- Rotor is direct coupled to motor driver with Falk Gridflex coupling, Model 1080 T10, 1.5 S.F. with guard.
- Impeller has backward curved blade design.
- Fan is selected at 60 Hz, 6-pole motor speed (1200rpm) for best combination of efficiency and reliability.
- Rotor is static and dynamic balanced to G2.5 tolerance.
- Bearings are antifriction type, grease lubricated.
- Shaft seal is HCV standard single aluminum disk design.
- AMCA Type C spark-resistant construction has been included.
- Primary control is by varying speed. An option price for a WEG motor and VFD has been offered. No dampers for control have been included. See WEG information for complete details of the motor and VFD offered.
- Motor would be received at the factory, mounted and aligned. VFD would be shipped loose for field installation.
- An Outlet Louver Damper (OLD) has been included for shut-off of the fan. The damper is provided with a Beck open-close electric actuator and all linkage for connection to the OLD.
- All external carbon steel surfaces are given an SSPC-SP3 surface prep and (1) Coat Howden Covert standard high temperature primer.
- Fan casing is provided with insulation pins for customer supplied acoustic/thermal insulation.
- All equipment is offered ExWorks Howden shop in St. Bruno (Montreal) Quebec, Canada. Packing for domestic shipment has been included.

- Enclosures include:
- o Price Schedule
  - o Fan Data Sheet
  - o Fan Performance Curve and Speed Torque Curve
  - o Fan Sound Data Sheet
  - o Outline Dimension Sketch of the Fan
  - o Howden Covert Terms and Conditions and Service Rate sheet

Please contact us if you require any further information at this time.

Best regards,  
 Howden Covert Fans Inc.  
 Greg Brill  
 Key Account Manager

HCVG680036 Quote.docx



**Regional Sales Office**  
 Howden Covert Fans Inc.  
 1775 Wehrle Drive  
 Williamsville, NY 14221  
 USA

**Head Office**  
 Howden Covert Fans Inc.  
 1381 Hocquet Street  
 Saint-Bruno, Quebec J3V 6B5  
 Canada

Tel: 450-441-3233 | Fax: 450-441-2189

[www.covertfans.com](http://www.covertfans.com)  
[www.howden.com](http://www.howden.com)

Tel: 716-817-6974 | Fax: 716-817-6903



**Pricing Data--**

Fan System	Induced Draft
Fan Model	C45S-4975 SWSI-1180
	\$46,126
Basic Fan, arr #8, overhung	Included
Accessories	Included
• Antifriction bearings, Grease lubricated	Included
• Falk Gridflex coupling, Model: 1080 T10, 1.5 S.F. with guard	Included
• G2.5 Tolerance Dynamic Balance	Included
• Bolted access doors in scroll and inlet box	Included
• Flanged inlet and outlet connections	Included
• Spark Resistant Type "C" Construction	Included
• Outlet Louver Damper (OLD) for shut-off	Included
• Beck Electric Actuator, for control of OLD	3,615
• WEG 50 HP, 1200 RPM, 3/60/460, TEFC Motor	6,574
• WEG 50 HP, 60 Hz, 460V Variable Frequency Drive (VFD)	6,235
• SP3 Surface Prep (1) Coat Howden Covent standard primer	Included
• Insulation pins for customer supplied insulation/cladding	Included
• Bump Test (Resonant frequency analysis)	Included
• Packing for domestic shipment	Included
<b>Sub-Total per unit FCA Howden Covent Plant</b>	
	<b>\$62,550</b>

**Terms and Conditions of Sale**

- Funds: Prices are in US dollars. Excludes Howden Covent Plant Quebec, CAN. (Freight and Tax extra)
- Terms: Howden Covent Fans Inc. Terms and Conditions of Sale shall apply
- Validity: This quotation is valid for acceptance for thirty (30) days.
- Warranty: 12 mo. from start-up or 18 mo. from shipment as per clause 6.1 of Howden Covent T&C
- Performance: Guarantee as per clause 5.2 of Howden Covent T&C
- Payment: as per section 13 in our terms and conditions.
- 10% of total contract value upon issue of outline drawings for review
- 15% of total contract value upon completion of engineering and shop drawings
- 35% of total contract value upon receipt of major materials at Howden Covent shop
- 40% of total contract value upon net 30 days from shipment or readiness to ship.
- Drawings: 8 weeks after order.
- Shipment: 28-30 weeks after approval of drawings.
- Field Service: Is extra at the rates as specified on the enclosed rate sheet.

**Fan Service: Induced Draft Performance Data - @ 3,500 ft elevation w/out Evase**

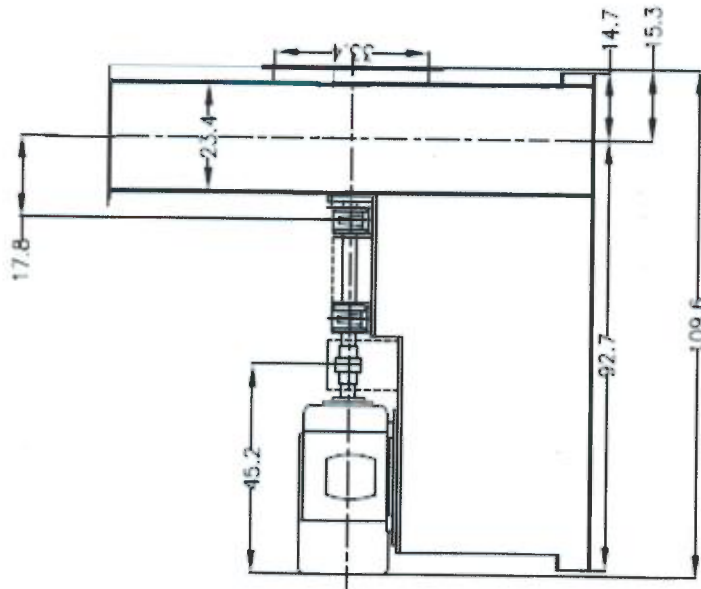
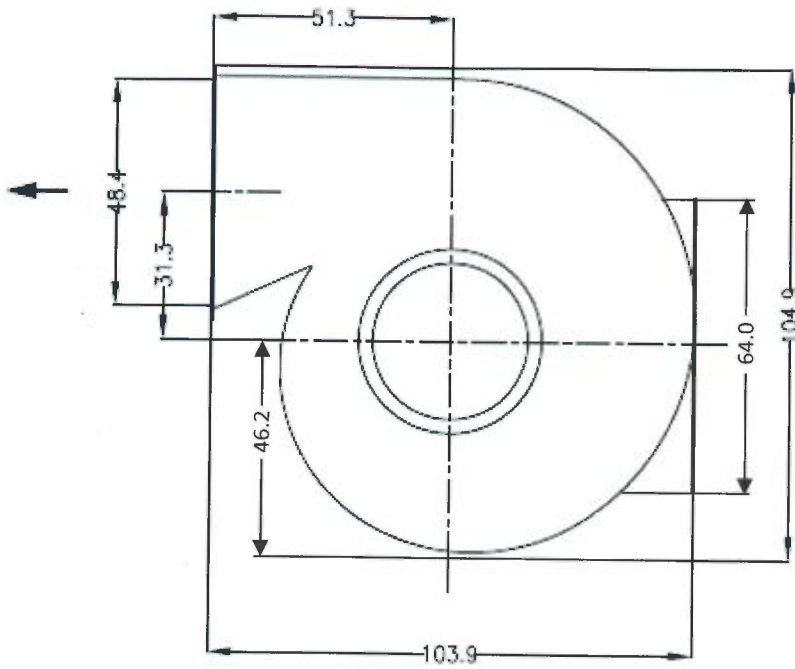
Fan Blade Type	Units	Backward Curved
Fan Model		C45S-5650
Condition	Kilb/hr	Rated
Mass Flow Rate	acfm	126,0009
Inlet Volume Flow Rate	°F	50,725
Inlet Temperature	lb/ft <sup>3</sup>	500
Inlet Density	in.wg	0.0414
Inlet Static Pressure	in.wg	-8.00
Outlet Static Pressure	in.wg	0.00
Static Pressure Rise	in.wg	8.00
Total Acc losses: OLD	rpm	-0.287
Fan Speed	hp	1,180
Power Consumption	%	84.1
Static Rise Efficiency		78.2%
No. VIV or ILD Present		N/A

\*Efficiency calculation is based on the absolute pressure rise of the fan + fan entrance pressure rise + fan accessory losses.

**Technical Data-**

Fan Model	Blade Type	Blade Type	Blade Type
	Width		C-45S-5650
Arrangement	Evase Area	Evase Area	Backward Curved
Nominal Wheel Diameter	Mechanical Design Temp.	Mechanical Design Temp.	8, overhung
Mechanical Design rpm	Tip Speed	Tip Speed	No Evase
Rotor Weight	Rotor Inertia (wk <sup>2</sup> )	Rotor Inertia (wk <sup>2</sup> )	56 ½
Rotor Inertia (wk <sup>2</sup> )	Shaft Material/Dia. @ Hub	Shaft Material/Dia. @ Hub	550
Shaft Material/Dia. @ Hub	Critical Speed Ratio/First Critical Speed	Critical Speed Ratio/First Critical Speed	1,180
Critical Speed Ratio/First Critical Speed	Bearing Type/Diameter	Bearing Type/Diameter	17,300
Bearing Type/Diameter	Housing Material/Thickness	Housing Material/Thickness	690
Housing Material/Thickness	Coupling	Coupling	1,433
Coupling	OLD Torque Required at -4°F	OLD Torque Required at -4°F	A588 / 3/16
OLD Torque Required at -4°F	Actuator for OLD	Actuator for OLD	AISI1045 (Hot Rolled) / 2 15/16
Actuator for OLD	Estimated Weight	Estimated Weight	1.9 / 2.242
Estimated Weight	Minimum Recommended Motor Size	Minimum Recommended Motor Size	Artifiction / 2 15/16
Minimum Recommended Motor Size			Grease
			A36 / Scroll = 3/16
			A36 / Sideplate = ¼
			Falk Gridflex coupling, Model: 1090 T10, 1.5 S.F. with guard, max motor bore: 3.9"
			50
			Actuator and linkage supplied by others
			Fan = 6,159
			Motor = 1,500
			Total = 7,659
			100

\*Data is subject to change during engineering phase at Howden Covent Fans Inc.



**Howden Covent Fans Inc. Howden**

CUSTOMER: \_\_\_\_\_

SERVICE: \_\_\_\_\_

FAN TYPE: \_\_\_\_\_

REF: \_\_\_\_\_ DATE: \_\_\_\_\_

**NOTES:**

rotation is 180° from vertical

**COMMENTS:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Fan Performance Curve**

S V.2.1.0.6  
Tel: (480) 441-3223 www.howden.com

Customer: EREC  
 Site No: Induced Draft  
 Fan Type: CASS-5650-600-R  
 Elevation: 0 Feet  
 Accessories: Curlet Damper

Reference: HCXGGB0038  
 Date: 4/19/2014  
 Estim. by: G Bril

14E16H25.DSGX



**SPEED-TORQUE CURVE**

Fan Model : CASS-5650

Job No. HCXGGB0038

Power Consumption : 84 BHP @

Rotor Wt: 1,433 lbs  
 Damper for Start-up? N

Motor Rating: 100 Hp  
 Motor FLT: 445 lb-ft

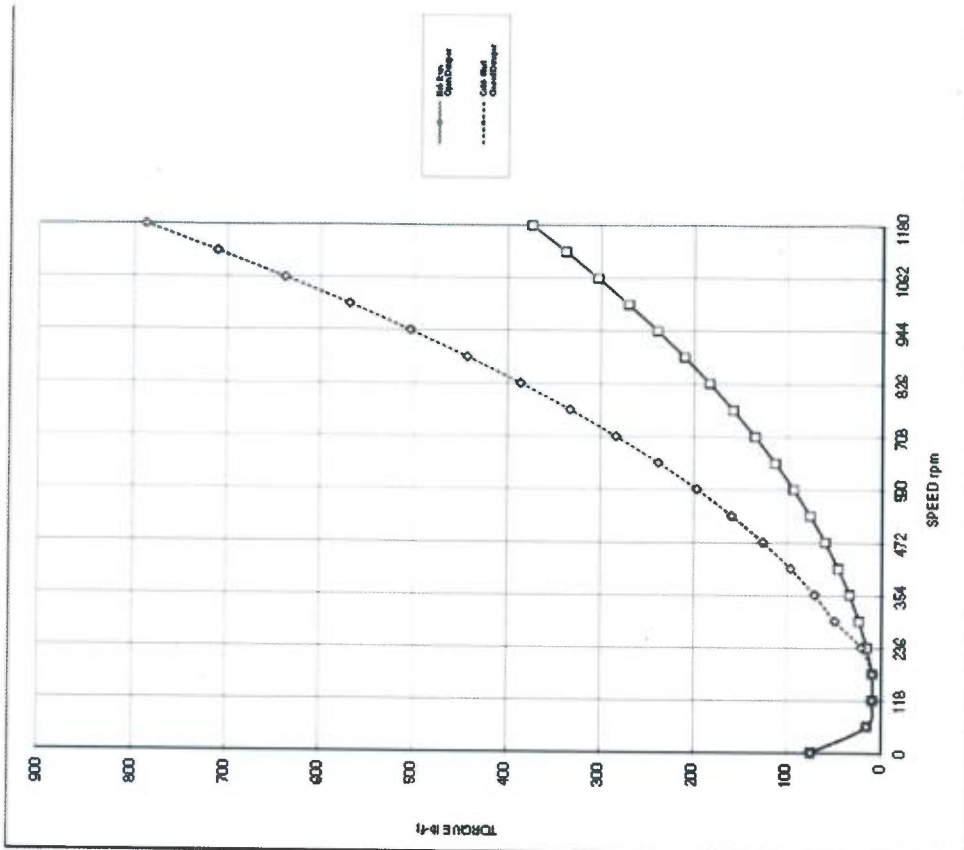
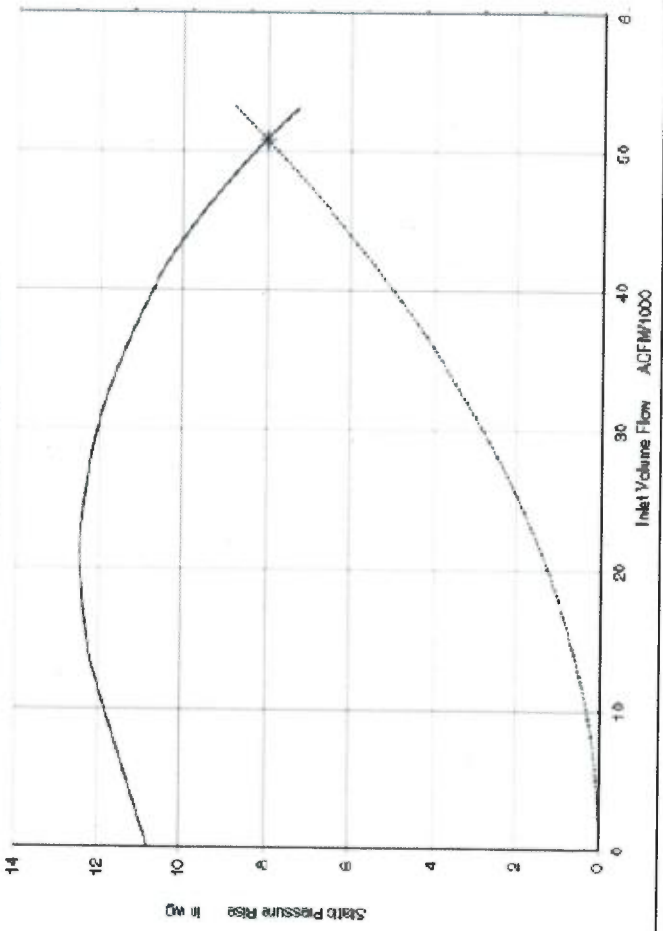
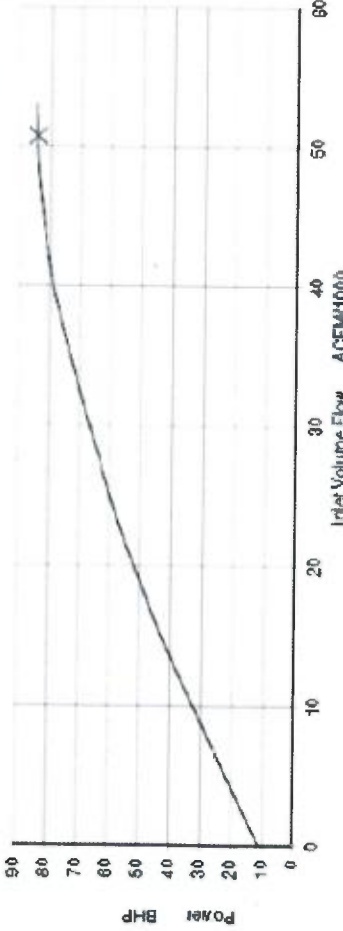
Howden Covent Fans Inc.

Item No. Induced Draft

500 °F

Torque at 1,160 rpm	500 °F	Hot-Run
	-1 °F	Cold-Start

Rated	No. IC	SPEED	TEMP	DENSITY	MASS	Ps-1	Ps-2	FLOW	POWER
	Deg	RPM	°F	lb/ft <sup>3</sup>	Klb/A	in wg	in wg	ACFM	BHP
	0	1160	500	0.0414	128.0	6.00	0.00	52785	84.10





V.J. Parnemsky Canada Inc.  
64 Semor Rd, Toronto, Ontario, M6A 1L6  
Tel: (416) 781-4617 Fax: (416) 781-4352



Hondson  
Hondson Covert 1912 Inc.

**Sound Levels**

Rev: (04/04/13/21) 582.1322 MICHAELB&B

Customer: E&EC  
Sales: Individual Draft  
Estimate: C-600-000-00-R  
Estimate: Q Bill  
Accessories:

Reference: HC-VGG800.36  
Date: 4/16/2014  
Estimate: Q Bill

**NOISE DATA IS ESTIMATED AND NOT GUARANTEED. A PARTIAL CLOSURE OF W/O R/L D. MAY INCREASE STATED NOISE LEVELS.**

- Take exception noise data is +/- 5 dB per band and +/- 5 dB overall
- Noise data is based on free field conditions
- Noise levels do not consider the effects of mechanical reverb from other equipment (fan, bearings, etc...) or any other background noise

Selection column: Head  
Blade Passage Frequency: 216 Hz  
Sound levels in octave band are in dB - Overall sound levels are in dBA

\*\*\*When the fan housing requires structural insulation, both inlet and outlet flexible connector fan and duct in units insulated to the same transmission loss as the fan for the inlet fan to the outlet silencer.

Frequency (Hz)	63	125	250	500	1000	2000	4000	8000	Overall
Un Ducted inlet	109	108	106	102	96	89	84	79	108
Un Ducted outlet	111	110	106	102	96	89	84	79	108
Un Housing	95	92	94	95	87	82	81	75	97
Lo at 1.0 m from casing	80	77	79	81	74	74	50	64	82
Lo at 1.0 m from its casing	78	77	75	66	61	41	31	16	69
4 in. acoustic muffle (4 in x 13) + 20 psi galvanized steel									

From: Dave Denham  
Company: Howden Covert  
Attn: Greg Brill  
Ref: E&EC HC-VGG800.36  
Quote #: 14-0415-DD-HC  
Date: April 16, 2014  
CC:  
Pages: 1

Thank you for this opportunity. I am pleased to submit this quote.

**Sec. 1 - Technical Data**

Phase: 3  
Degree of Protection: IP55  
Ambient Temperature: 40°C  
Duty: Continuous  
Bearings: Ball  
Insulation: F  
Service Factor: 1.15  
Temperature Rise: 80°C  
Enclosure: TEFC  
Altitude: 3000 masl  
Voltage: 460V  
Frequency: 60Hz  
Mounting: F1  
All motors driven with a VFD have a 1.05F per NEMA MG1-Part 31

**Sec. 2 - Quote Details**

Item #	Qty	HP	RPM	Frame	Data Sheet	Unit Price (\$)
1	1	100	1200	444/5T		56,906.00

Currency:  Canadian Dollars  US Dollars  Other

**Sec. 3 - Notes**

- Nema premium w/22

**Sec. 4 - Comments and Exceptions- No specifications**

Page	Item	Remarks	Cor E**

\*\*C - Comment E - Exception

**Sec. 5 - General Sales Conditions**

Delivery: 10-11 weeks from approval to manufacture  
Quote Validity: 90 days from quotation date  
Taxes: Prices specified herein do not include any Provincial taxes, GST, or other taxes.  
Terms: Net 30 days from invoice date.  
Conditions: Subject to V.J. Parnemsky Canada Inc. terms and conditions available at www.parnemsky.com  
Shipping: FOB Covert Shop

If you require further assistance, please do not hesitate to contact us.  
Best regards,

Dave Denham





WEG Canada / V.J. Parnemsky  
 64 Samor Road  
 Toronto Ontario M6A 1J4  
 Toll Free 1 800 ASK 4WEG

Phone: (416) 781-4617  
 Fax: (416) 781-4352  
 Processo:

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- 2 non isolated, programmable functions, analog outputs, resolution 11 bit, 0..10 V
- Protective Features: Overcurrent/Short circuit, Under/Over voltage in the power circuit, Phase loss, Over Temperature in the inverter (IGBTs, rectifier and internal air on the electronic boards), Over Temperature in the motor (requires thermistors or thermostat), Overload in the braking resistor, Overload in the IGBT's, Overload in the motor, Fault / external alarm, Phase to ground short circuit at the output, Fault in the heatsink fan, Over speed of motor, Incorrect Programming, Incorrect Connection to the encoder.
- Control Features: Linear and "S" acceleration and deceleration independently adjustable ramps, local/remote control, DC braking, torque boost, motor slip compensation, electronic pot, multi speed, maximum and minimum adjustable frequency limits, three skip frequencies, adjustable output current limit, JOG and ride-thru, PID regulator
- Built in DC link reactor, that will allow the VFD to be installed in any network (there is no minimum impedance restriction), with any model
- Intelligent Thermal Management, the CFW 11 monitors the heatsink and internal air temperature, to operate the fans according to the following selection: run all the time, disable the cooling fan and operate the fan with a thermostat.
- Soft PLC built in, designated space in the memory 15 KB, ladder language programming using WLP software (free from the internet), access to all VFD parameters and I/Os, configurable PLC, mathematical and control blocks
- Trace Functions, to register CFW11 variables when a triggering event occurs, the trace function simulates a 4 channels oscilloscope
- Multi speed up to 8 preselected speeds
- PID regulator, Ride Through, Skip frequencies
- Safety Stop in accordance with EN - 954 - 1, category III
- Applications include, but not limited: Over head crane lifting, Cooling, Sugar and Alcohol, Process Machines, Paper and Cellulose/Wood, Cement and Mining, Chemical and Petrochemical, Ironworks and Metallurgy
- If a WEG inverter duty motor is connected to the a WEG VFD there is no need of load reactor if the distance from the drive to the motor is up to 100 meters (330 feet)
- Display readings: Motor speed, frequency, current, voltage and drive status, hours of operation, energy measurement, fault condition, software version, DC voltage level, status of digital inputs and outputs.
- Ambient: -10 to 50°C, 3300 ft (1000m) altitude without de-rating
- Braking capabilities: External braking resistor, Optimal braking and DC braking
- Expansion Boards available as plug ins with additional digital inputs, analog inputs, analog output and digital outputs, PLC boards, Communication boards
- UL, cUL, CE Certifications
- F further features available upon request or in literature provided

**Option # 2 - CFW 700**

Qty	Hp	Amps	Volts HZ	Model	Unit US \$	Total Net US \$
1	100	121	480 / 60	CFW700C142P514DBN1	\$5,944.00	\$5,944.00

**NOTES:**

- VFD was sized for Variable Torque Application,
- VFD is NEMA 1
- Communication options are extra
- Commissioning is extra
- Stand-alone option, no cabinet is included

**CFW700 SPECIFICATION SUMMARY**

- Output frequency, 0 to 3.4 times motor rated frequency (P403). This rated frequency (P403) can be set from 0 to 400 Hz in V/Hz and from 30 to 120 Hz in vector mode, as a result the output frequency could be set 0 to 1020 Hz for V/Hz Control, 0 to 408 Hz for Vector Control
- Overload:
  - Normal Duty Cycle: 110 % for 60 s, every 10 min; 150 % for 3 s every 10 min.
  - Heavy Duty Cycle: 150 % for 60 s, every 10 min; 200 % for 3 s every 10 min
- 32 BIT microprocessor controlled PWM output
- Family from 1.5 to 150 HP
- 200 - 240 V and 380 - 480 V, 500 - 600 V
- Plug and Play philosophy (connect and use)
- Human - Machine interface (HMI) with backlit display and soft keys

WEG Canada / V.J. Parnemsky  
 64 Samor Road  
 Toronto Ontario M6A 1J4  
 Toll Free 1 800 ASK 4WEG

Phone: (416) 781-4617  
 Fax: (416) 781-4352  
 Processo:

Page: 1/4

To: Howden Covert  
 Greg Brill

From: WEG Canada / V.J. Parnemsky  
 Contact: Alfonso Cordova  
 Cc: Dave Denham

V.J. Parnemsky Offer: 14 - 0415 - 1 - AC - HOWDEN CFW11  
 Customer Reference: HCYG9B0036

Phone: 716 - 817 - 6903  
 Fax: 716 - 817 - 6974  
 E-mail: gbrill@howdenbuffalo.com  
 alfonso@wegcanada.com

Date: April 17, 2014

Dear Greg

Concerning your request for quote we are pleased to provide our quotation submittal as follows.

**Option # 1 - CFW 11**

Qty	Hp	Amps	Volts HZ	Model	Unit US \$	Total Net US \$
1	100	121	480 / 60	CFW110014.2T4SZ	\$6,235.00	\$6,235.00

**NOTES:**

- VFD was sized for Variable Torque Application,
- VFD is IP 20
- Communication options are extra
- Commissioning is extra
- Stand-alone option, no cabinet is included

**CFW11 SPECIFICATION SUMMARY**

- Output frequency, 0 to 3.4 times motor rated frequency (P403). This rated frequency (P403) can be set from 0 to 400 Hz in V/Hz and from 30 to 120 Hz in vector mode, as a result the output frequency could be set 0 to 1020 Hz for V/Hz Control, 0 to 408 Hz for Vector Control
- Overload:
  - Normal Duty Cycle: 110 % for 60 s, every 10 min; 150 % for 3 s every 10 min.
  - Heavy Duty Cycle: 150 % for 60 s, every 10 min; 200 % for 3 s every 10 min
- 32 BIT microprocessor controlled PWM output
- 2.5/5.0 / 10.0 kHz adjustable output power IGBT's switching frequency
- Built in DC link chokes mounted on the + and - DC link, meets IEC 61000-3-12 standard related to low order current harmonics in the power network
- Plug and Play philosophy, allowing the addition of expansion boards with almost no need of tools
- Graphic keypad display, with soft keys, backlight, real time clock, copy function, plug - in with CFW 11 on, language selection, option for remote keypad installation
- Programming Mode: Oriented Start - up, Basic Applications, Fault History Group, Read Only parameters, group, Back up parameters group, Selectable Language.
- Password to protect inverter programming
- Super Drive software downloadable for free from the internet, to allow navigate through the complete programming menu of the VFD
- Braking Capabilities: Dynamic Braking, Optimal Braking and DC Braking
- Multi pump capabilities, via Soft PLC programming
- Control mode selection (via parameter): V/Hz (scalar 50 / 60 Hz), adjustable V/Hz control Voltage Vector WEG (V/VW), Sensorless Vector and Vector with Encoder (additional hardware is require for this option).
- Specific unit indication
- Flash Memory Module, stores image of the CFW 11, allows the transfer of parameters and application software (Soft PLC applications)
- Firmware can be updated in the field to add capabilities to the CFW 11.
- Selectable language programming
- Modbus RTU (built-in), Profibus DP, Device Net, CAN Open, Ethernet TCP/IP, Modbus TCP/IP and USB communication available with expansion boards
- 6 programmable functions, digital inputs isolated 24 VDC
- 3 programmable functions, relay outputs 240 VAC / 1 A, 2 relays form C and 1 relay form A
- 2 non isolated differential inputs, functions programmable, analog inputs resolution 10 bit, 0..10 V / 0..20mA / 4...20mA.

WEG Canada / V.J. Parnensky  
 64 Samor Road  
 Toronto Ontario M6A 1J4  
 Toll Free 1 800 ASK 4WEG

Phone: (416) 781-4617  
 Fax: (416) 781-4352  
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The warranty period is for 12 months, from the date of installation or 18 months from the date of invoicing.

**WEG Field Service Rates:**

Basic Service Rate	Charge Basis	Rate (US \$)
Field Service, Training & startup assistance Monday to Friday Up to 10 hrs		\$180.00 / hr
Weekdays - Time in excess of 8 hours Saturday - Up to 8 hours Total work time not to exceed 12 hours in any 24 hour period		\$270.00 / hr
Saturday - Time in excess of 8 hours Sunday's & Holidays Total work time not to exceed 12 hours in any 24 hour period		\$360.00 / hr
Holdover / Standby Time	Any and all delays regardless of reason that impedes the WEG employee from performing the required repairs or training	Billed at Basic service rates Overtime (standard) Overtime (Special)
Overnight	Hotel Accommodations	Cost
Travel Time	Travel time to and from a WEG location to the jobsite	Billed at Basic service rates Overtime (standard) Overtime (Special)
Auto Travel	Use of company or personal cars Distance calculated to and from the local WEG office to destination (i.e. job site, airport, etc)	\$0.55 / Km
Public Transport / Parking Tolls	Rental cars, Airfares, Taxis, Parking, Tolls, etc	Cost

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 Toronto Ontario M6A 1J4  
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 Processo

Page: 3/4

DC link inductors (symmetrically connected to positive and negative DC link terminals) enable compliance with IEC61000-3-12 standard requirements regarding harmonics (no need for external line reactance) Intelligent thermal management permits full protection of IGBT's monitoring of heatsink and internal air temperature.

- Protections with fault and alarm warning
- Motor overload protection in compliance with IEC 60947 - 4 - 2 / UL508C
- Soft PLC function allows user to create special functions without external PLC
- Encoder input as standard
- RS - 485 port wired terminals
- 2.5 / 5.0 / 10.0 kHz adjustable output power (IGBT's switching frequency
- Programming Mode: Oriented Start - up, Basic Applications, Fault History Group, Read Only parameters, group, Back up parameters group, Selectable Language.
- Password to protect inverter programming
- Super Drive software downloadable for free from the internet, to allow navigate through the complete programming Menu of the VFD
- Braking Capabilities: Dynamic Braking (Up to frame size D built into the unit as standard) frame E optional), Optimal Braking and DC Braking
- Multi pump capabilities, via Soft PLC programming
- Control mode selection (via parameter): V/Hz (scalar 50 / 60 Hz), adjustable V/Hz control Voltage Vector WEG (V/WV), Sensorless Vector and Vector with Encoder
- Specific unit indication
- Selectable language programming
- Modbus RTU (built-in), Profibus DP, Device Net communication available with an expansion board
- Flash memory module (available as an option)
- 8 programmable functions, digital inputs isolated 24 VDC
- 1 programmable functions, relay outputs 240 VAC / 1 A, and 4 Digital outputs
- 2 non isolated differential inputs, functions programmable, analog inputs resolution 10 bit, 0..10 V / 0..20mA / 4..20mA
- 2 non isolated, programmable functions, analog outputs, resolution 11 bit, 0..10 V
- Protective Features: Overcurrent/Short circuit, Under/Over voltage in the power circuit, Phase loss, Over Temperature in the inverter (IGBT's, rectifier and internal air on the electronic boards), Overload in the braking resistor, Overload in the IGBT's, Overload in the motor, Fault / external alarm, Phase to ground short circuit at the output, Fault in the heat sink fan, Over speed of motor, Incorrect Programming, Incorrect Connection to the encoder
- Control Features: Linear and "S" acceleration and deceleration independently adjustable ramps, local/remote control, DC braking, torque boost, motor slip compensation, electronic pot, multi speed, maximum and minimum adjustable frequency limits, three skip frequencies, adjustable output current limit, JOG
- Multi speed up to 8 preselected speeds
- PID regulator, Skip frequencies
- Applications include, but not limited: Extruders, Winders, Paper Machines, Over head crane lifting, Press Feeders, Pumps, Fans, Conveyors, etc
- If a WEG inverter duty motor is connected to the a WEG VFD there is no need of load reactor if the distance from the drive to the motor is up to 100 meters (330 feet)
- Display readings: Motor speed, frequency, current, voltage and drive status, hours of operation, energy measurement, fault condition, software version, DC voltage level, status of digital inputs and outputs.
- Ambient: -10 to 50°C, 3300 ft (1000m) altitude without de-rating
- Braking capabilities: External braking resistor, Optimal braking and DC braking
- Expansion Boards available as plug-ins with additional digital inputs, analog inputs, analog output and digital outputs.
- UL, cUL, CE Certifications
- Further features available upon request or in literature provided

**WARRANTY TERMS**

The warranty responsibility is limited only to repairs, changes or replacement of the supplied automation product. V.J. Parnensky Canada will have no obligation or liability whatsoever to people, third parties, other equipments or installations, including without limitation, any claims for loss of profits, consequential damages or labor costs.

The warranty does not cover the normal wear of the product or equipment, neither damages resulting from incorrect or negligent operation, incorrect parameter setting, improper maintenance or storage, operation out of technical specifications, bad installation, or operated in ambient with corrosives gases or with harmful electrochemical atmospheric influences.

**Clarifications**

- All items quoted are limited to information and design conditions known to V.J. Parnensky Canada Inc. at the time of tender.
- If travel is required, costs such as hotel or flights will be billed at cost.
- Where applicable, WEG control products will be used in any panel supplied.

**TERMS AND CONDITION OF SALE**

- Standard V.J. Parnensky Terms and Conditions of Sale.
- Stock here in Toronto.
- Toronto
- F.O.B.:
- Validity: Thirty (30) days from date of this proposal.
- Price: in American dollars.
- Payment: 30 days credit
- Taxes: Extra

We trust the above and attached information is to your satisfaction. If you should require any additional details, or further clarification, adjustments with terms etc, please do not hesitate to contact us. We look forward to discussing this opportunity with you further at your earliest convenience.

Sincerely yours,

Alfonso Cordova  
 V.J. Parnensky Canada Inc.

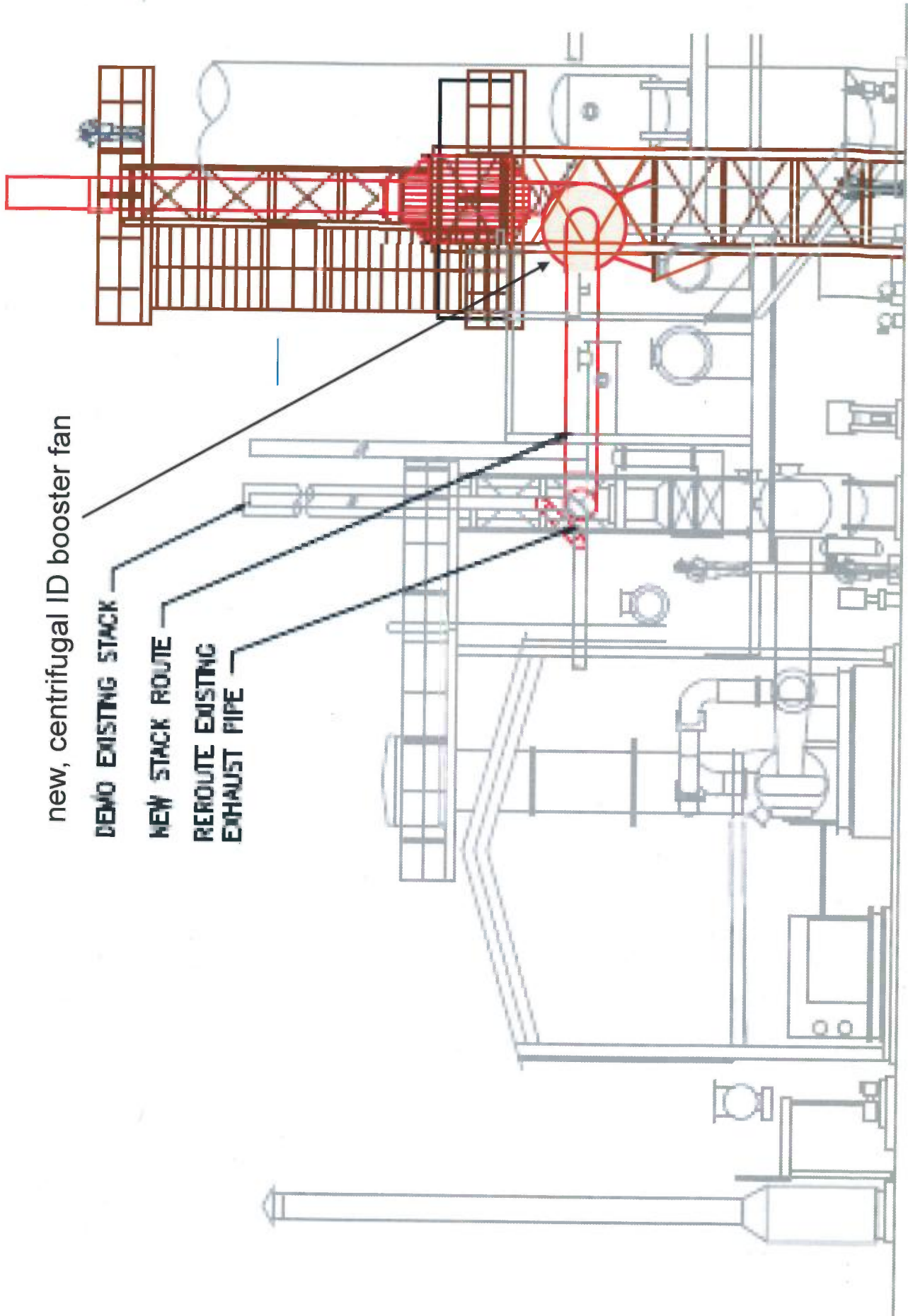
## **2. Fan Location:**

A distinct feature of centrifugal fan design, namely the fact that the gas stream is being turned 90°, is particularly advantageous in this case, since it inherently overcomes the 90° turn required from the horizontal flow flue gas duct coming from the existing stack into the vertical flow SCR reactor and the new stack on top of the SCR reactor. This allows ideally for placing a centrifugal SCR booster fan directly underneath the SCR reactor as shown in the following sketches. This works very well at the design and location of the new SCR on the south side of AOP4 as found technically feasible and proposed by Advantech.

With the correct selection of a centrifugal fan and its placement underneath the SCR reactor as sketched above, a straight duct length of greater five duct diameters on the inlet side is ensured as shown in the sketches below. Since the SCR reactor, which also acts as a silencer for the fan, and the new stack should be located directly above the new, centrifugal fan, the same is true for the outlet side. Therefore, this claim by Advantech shows to be eliminated.

## **3. SCR Location:**

Advantech, a consultant retained by ANP, concluded that a new SCR can be retrofitted at the south side of the plant, but an alternative is locating the SCR directly to the north of the existing stack. The advantage of locating the SCR to the north would be a straight duct run from the existing stack to the SCR booster fan. The SCR including its booster fan would be installed on a new elevated platform, similarly to the design proposed by Advantech for the south side location. This would ensure that traffic lanes along the north side of AOP4 would remain open. Concerns for access to equipment along the north side of AOP4 including heat exchangers, which may need to be replaced regularly, can still be maintained by simply making the straight duct run between the new SCR booster fan and the existing stack removable. Flanged connections on either side allow for such easy removal when needed.



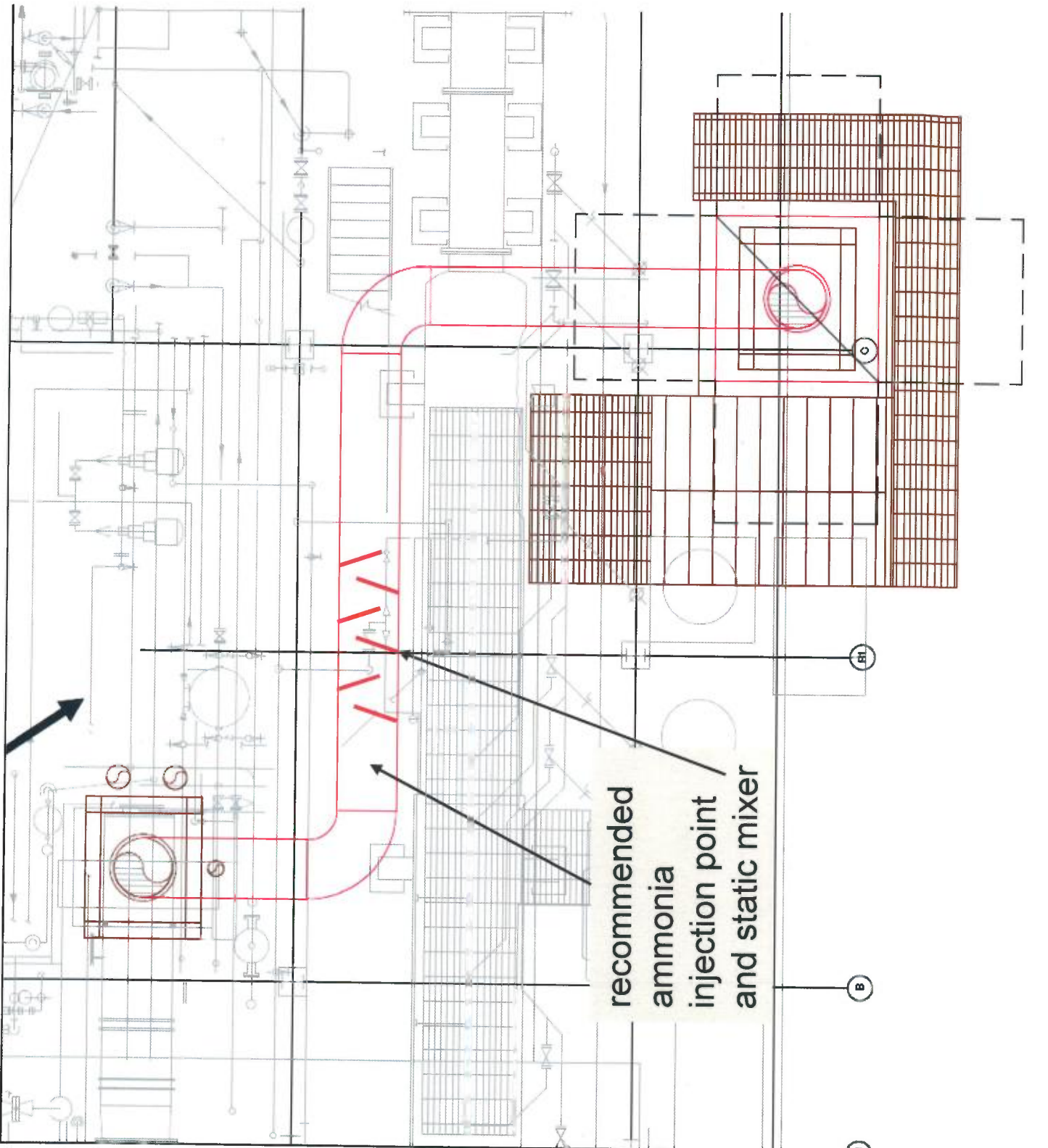
new, centrifugal ID booster fan

DEMO EXISTING STACK

NEW STACK ROUTE

REROUTE EXISTING

EXHAUST PIPE



recommended  
ammonia  
injection point  
and static mixer

#### 4. Open Bypass Concept:

The concept of an open bypass upstream of an induced draft (ID) booster fan is commonly used in order to avoid any possible pressure changes within the gas path upstream of the open bypass. In case an existing stack is used as an open bypass, the term "burp stack" is also often used. The open bypass eliminates any possible back pressure concerns of the downstream equipment on the existing plant.

An open bypass is realized by simply tying in the new downstream equipment at the bottom of the existing stack without any damper. The flow path through the existing stack remains open. The ID booster fan is controlled by a pressure indicator at the bottom of the existing stack, which regulates the ID booster fan motor, which is equipped with a variable frequency drive (VFD), so that the same or a very slightly lower pressure is maintained at the bottom of the existing stack compared to current operation. Since the exhaust gas always follows the path of least resistance and the ID booster fan pushes the exhaust gas out through the additionally installed equipment, all the exhaust gas is sucked into the ID booster fan being always stronger than the natural draught of the existing stack.

Some of the largest and most advanced coal-fired power plants in the country feature open bypass concepts. These electric generating units with in some cases well over 700 MW net generating capacity and flue gas volume flow rates almost 100 times greater than Apache Nitrogen's AOP4 successfully use the open bypass concept despite the fact that these very large flue gas systems are much more difficult to balance and control than the comparatively small system of AOP4.

It is at least equally critical to maintain a constant negative pressure in a coal-fired power plant boiler as it is in AOP4, which makes this concept ideally suited for this application. It is recommended that ANPI to conduct its own independent due diligence on these open by-pass applications.

