

membrane expansion proposal

to:	City of Riverside, California referred to here as Riverside or Buyer	date:	June 11, 2020
		no. of pages:	40 including cover
attention:	Gilbert Perez	email:	giperez@riversideca.gov
plant address:	5950 Acorn Street, Riverside, CA 92504 USA	telephone no.:	951 351 6276
from:	Jason Diamond regional lifecycle manager western USA	email:	jason.diamond@suez.com
		telephone no.:	905 465 3030 x3273
		cell no.:	905 399 7055
cc:	Ernest Marquez, Matt Rebmann (The Coombs Hopkins Company)		
subject:	membrane expansion: 26 to 33.5 MGD ADF -1536 x ZW500D 370ft ² modules + 32 x ZW500D 48/52M cassette frames	proposal no.:	225109-5
		original project no.:	U-500220
plant data:	Please provide corrections if inaccurate Riverside Water Quality Control Plant (RWQCP), municipal sanitary wastewater treatment; original installation 8 trains, 14 x ZW500D 48M cassettes per train, ZW500D 370ft ² modules.		

proposal provisos

This proposal has been issued based on the information provided by the customer and on information currently available to SUEZ Water Technologies & Solutions at the time of proposal issuance. Any changes or discrepancies in site conditions, including but not limited to changes in system influent water characteristics, changes in environmental health and safety (EH&S) conditions, changes in the reissued state/provincial disposal system permit, changes in buyer financial standing, buyer requirements, or any other relevant change or discrepancy in the factual basis upon which this proposal was created may lead to changes in the offering, including but not limited to changes in pricing, guarantees, quoted specifications, or terms and conditions.

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1 introduction

SUEZ Water Technologies & Solutions is pleased to present this expansion proposal at the request of City of Riverside, California for wastewater membrane modules to increase the flow at the Riverside Water Quality Control Plant.

Riverside has requested a 32 cassette membrane expansion proposal. This will accommodate an increase in the annual average daily plant capacity from 26 MGD to 33.5 MGD.

SUEZ proposes that this can be accomplished with the addition of 32 x ZW500D 48/52M cassettes. This will still leave 2 empty cassette slots per train along with the additional spare space within the new 52-module version of the cassettes for future considerations.

SUEZ recommends consolidating existing cassettes such that the new cassettes can all be installed in two trains, leaving only 2 existing cassettes in each of those trains; see section 3.

SUEZ is a proven leader in delivering tangible value to our clients over the life of the plant. Our measure of success is how well we deliver solutions that help our clients meet their critical business objectives.

Through long-acquired membrane experience, SUEZ has clearly distinguished itself from other membrane manufacturers. A mature service culture and deep technical expertise are at the ready to serve and support Riverside.

SWTS would like to note that under the current exceptional circumstances during the COVID 19 Pandemic situation, SWTS may not be in a position to guarantee and comply with the planned schedule for project delivery or performance and that should there be any new measures taken by any governmental authority which may impede or delay the said schedule or performance, SWTS reserves the right to modify the schedule / contract accordingly. SWTS will promptly inform you of any changes which may impact the contract or the project.

2 SUEZ scope & price

SUEZ's scope includes the material and services outlined in the table below. The sections that follow provide additional detail regarding each scope item.

item description	part #	quantity	price (USD)
Preliminary engineering review			
preliminary engineering review of biological aeration capacity for increased flow (includes summary report) ^{note 1}		1	10,200
System expansion project			
ZW500D 370 ft ² membrane modules (USD \$1,836.80 ^{note 2} /module)		1536	4,133,160
2+8 year prorated replacement membrane warranty, section 10		incl.	
ZW500D,48/52M,316L,LEAP cassette,6IN		32	
hanger arms, leveling pins and installation hardware		32 sets	
aeration and permeate spool connections		32 sets	
miscellaneous tools and spares, section 4.4		lot	
spare blower, section 4.5		1	
blower installation, section 6.3		incl.	392,135
in-house support, O&M manual update, project management, section 6.1		incl.	
on-site support, 1 FSR, 16 x 8-hr days on-site plus travel & living, section 6.2		1	
freight, DDP Riverside Water Quality Control Plant, section 5		incl.	164,665
All figures are in USD			
Please make purchase order to ZENON Environmental Corporation		total price	4,700,160

note 1: SUEZ will need design report on biological treatment systems and other pre and post treatment unit sizing, pictures of the process blower and motor nameplates, P&IDs and any information on the blowers available (e.g. sizing report, blower curves etc.), drawings of the biological treatment units with operating water levels for this engineering review.

note 2: for this purchase, SUEZ has applied a USD \$100/module discount to our commercial price as acknowledgement of the strong customer relationship with Riverside

invoicing schedule	% of total invoice
preliminary engineering review	
An invoice will be issued upon acceptance of SUEZ preliminary engineering review report.	100%
system expansion project	
An invoice will be issued upon acceptance by SUEZ of customer purchase order. Percent calculation based on full scope of the purchase order. Shipment of membranes is contingent on receipt of this initial milestone payment.	30%
An invoice will be issued when membrane module shipping documents are supplied to the carrier.	60%
A final invoice will be issued upon completion of installation, or 30 days after delivery if SUEZ is not providing onsite technical installation support.	10%
NOTE: Taxes will be added to the above total at time of invoicing	100%

SUEZ's current commercial module price for the ZW500D 370ft² module is USD \$1,936.80 and less than the calculated GMPC price as shown below. Membrane pricing in the previous proposal was based on commercial price and, for this proposal, SUEZ is happy to offer a further price reduction of \$100/membrane to the City of Riverside for this MBR expansion.

contractual basis for membrane purchase price

From the original project, SUEZ has provided a guaranteed membrane purchase cost (GMPC) and maximum membrane replacement cost (MMRC) for 370 ft² ZW500D membrane modules. The GMPC (not replacements) for this site is \$1,786 US per module, subject to adjustment for inflation (CPI + 1%).

GMPC and MMRC price escalation - calculation of inflation begins on August 7, 2012 (PCL Construction PO date).

Membrane prices are quoted FCA manufacturing plant - Oroszlány, Hungary , with packaging, freight, and taxes extra as the cost of shipping and packaging the membranes to site will depend on the quantity per shipment. Membrane prices are quoted without taxes.

non-warranty adjusted membrane purchase price to Sep 2019	
contractually guaranteed membrane purchase cost - USD	1,786.00
inflation index value from Aug 2012	230.379
forecasted inflation index value – Sep 2019	256.571
inflation index factor +1%	12.84%
adjusted membrane price for this proposal – USD	2,015.31

These prices are guaranteed from ten years from the date of the agreement, set to expire September 2020. The following excerpts are from the "Agreement to Furnish MBR System to City of Riverside for Riverside RWQCP Phase 1 Expansion", September 2010, showing the documentation for the membrane purchase prices.

PROPOSAL SCHEDULE OF PRICES

Schedule of prices to be guaranteed to OWNER by MSS for equipment, material, systems, and services for the MBR System provided in accordance with the RFP.

Item	Description
1. Membrane Bioreactor System (MBR System), Including Base Warranty	
a. Plant Equipment including Base Warranty and Taxes	
Lump sum of	\$ 14,493,966.19 (Price in Figures)
b. PLC Programming	
Lump sum of	\$ 169,100.00 (Price in Figures)
c. Commissioning/Startup	
Lump sum of	\$ 478,235.00 (Price in Figures)
d. Operator Training	
Lump sum of	\$ 69,450.00 (Price in Figures)
e. Freight	
Lump sum of	\$ 280,000.00 (Price in Figures)
f. Special Engineering Services	
Lump sum of	\$ 464,050.00 (Price in Figures)
Total MBR System Price	
Lump sum of	\$ 15,954,801.00 (Price in Figures)
2. Maximum Membrane Replacement Cost (MMRC) per module	
Lump sum of	\$ 950.00* (Price in Figures)

3. Air Scour Energy

Annual cost of \$ 239,057.00
(Price in Figures)

4. Optional Repair and Replacement Services

Annual fee of \$ 68,449.00
(Price in Figures)

5. Optional Extended Membrane Warranty

Lump Sum of \$ 0.00
(Price in Figures)

6. Optional Extended Service Agreement

Annual fee of \$ 64,469.00
(Price in Figures)

7. Guaranteed Membrane Purchase Cost (GMPC) per module

Lump Sum of \$ 1,786.00*
(Price in Figures)

*Pricing does not include taxes

3 ZeeWeed configuration

configuration data	existing plant configuration	proposed expansion configuration to 33.5 MGD		
number of trains, plant	8	6	2	
number of cassettes spaces per train	20	20	20	
number of cassettes/train	14	18	2	16
number of this type of cassette per plant	112	112		32
total number of cassettes per plant	112	144		
maximum number of modules per cassette	48	48		52
number of modules per cassette	48	48		48
type of ZeeWeed membrane	500D	500D		
module surface area, ft ²	370	370		
total module count, plant	5,376	6912		
total surface area, ft ² , plant	1,989,120	2,557,440		
% spare space	30%	12%		
% surface area increase from existing, plant	-	28.6%		
minimum temperature °C	20.0	20.0		
flow capacity, average day flow (ADF), GPD	26,000,000	33,500,000		
design net flux, GFD at ADF at min. temp., (gal/ft ² /day)	13.1	13.1		
maximum month flow (MMF), GPD	30,700,000	39,400,000		
design net flux (gfd) at MMF	15.43	15.41		
maximum week flow (MMF), GPD	39,000,000	50,000,000		
Design Net Flux (gfd) at MWF	19.6	19.6		
maximum day flow (MDF), GPD	39,000,000	50,000,000		
design net flux (gfd) at MDF	19.6	19.6		
peak hour flow (PHF), GPD	39,000,000	50,000,000		
design net flux at PHF, gfd	19.6	19.6		
ADF when two trains are offline (N-2 condition) for less than 7 days, GPD	26,000,000.0	33,500,000		
design net flux at ADF N-2 condition, gfd	17.4	17.5		
MMF when one train is offline (N-1 condition) for less than one month, GPD	30,700,000.0	39,400,000		
design net flux at MMF N-1 condition, gfd	17.6	17.6		

MDF when one train is offline (N-1 condition) for less than 2 days, GPD	39,000,000.0	50,000,000
design net flux at MDF N-1 condition, gfd	22.4	22.3

The production flows stated in the previous table consider membrane surface area only. Existing bio treatment units, RAS pumps, pre and post treatment system and associated piping requires review (by Riverside or a third party) to determine the ability to handle the increased flow. Suez has completed a preliminary review of the existing permeate and backpulse pumps and it appears they are able to handle the increased flows and will complete a review of the system biological aeration capacity as part of this agreement.

4 material description

4.1 membrane modules

Supply ZeeWeed 500D 370ft² wastewater membrane modules, factory installed in the ZW500D 52M cassette frames (section 4.2), bagged and crated ready for ocean shipment.

4.2 cassette frames

Supply 500D 48/52M configured LEAPmbr cassette frames.

4.3 cassette installation hardware

Supply associated hardware as follows:

- ☐ 6" spool connection between new cassettes and existing permeate header, includes Straub fittings;
- ☐ 3" spool connection between new cassettes and existing aeration header, includes Straub fittings;
- ☐ Hanging arms(set of 4 per cassette frame), leveling pin sets (set of 4 per cassette frame), and all hardware that connects the arms to the cassettes

4.4 membrane and cassette tools and spares

- ☐ Spare #118 EPDM permeate spigot o-rings;
- ☐ Spare ZW500D element end cap keys;
- ☐ Blank module header sets;
- ☐ Eye bolt kit for turning the cassettes upright prior to installation.

4.5 additional blower

SUEZ will supply one additional NX300-C050 APG-Neuros NXTurbo Blower to match the operational blowers currently in use at Riverside; see attachment b for further details.

5 delivery

- ☐ **DDP** - Delivery will be by standard ocean/ground on the basis of DDP RWQCP, 5950 Acorn Street, Riverside, CA, USA or other named place of destination; Incoterms 2010. DDP = delivery duty paid. Partial shipments will be acceptable unless otherwise specified. Where delivery cannot be accepted at this destination, Riverside shall specify an alternate, equivalent destination without delay.

Due to varying origins and availability, non-membrane items included in this proposal may be shipped separately from the membranes. Should separate shipments be required, where possible, SUEZ will strive to provide these items on or before the delivery of the membranes.

- ☐ **origin** - Delivery of ZeeWeed membranes originates from the SUEZ Water Technologies & Solutions, ZENON Membrane Products (ZEM), Bláthy Ottó u 4, Oroszlány, 2840 Hungary facility.
- ☐ **title & risk** - Title and risk of loss or damage to membrane modules, cassette frames and crating shall pass to Riverside upon delivery at the named place of destination.
- ☐ **export documents** - All ZeeWeed membrane module shipments into the USA require clearance documentation from the EPA. SUEZ will prepare and provide the required EPA documentation to the Carrier.
- ☐ **MPF** - Merchandise processing fee is a fee assessed for formal custom entries based on 0.35% of the invoice value, with a minimum of USD \$25 per formal entry and a maximum of USD \$485. On the basis of DDP terms, this fee will be paid by SUEZ within the quoted price.
- ☐ **duty** - Any new duty imposed after the date of this proposal is the responsibility of Riverside.
- ☐ **taxes** - All applicable local, state, or federal taxes are the responsibility of Riverside. These will be added at the time of invoicing to be collected by SUEZ and paid on behalf of the City.
- ☐ **temperature** - UF membranes cannot be allowed to freeze or overheat and may require temperature-controlled freight and handling according to the season and the planned routing. If required, the price of temperature control will be included within the firm quote on freight by SUEZ.
- ☐ **unloading** - may require one of or a combination of a loading dock, extended forks and an experienced fork lift driver at delivery destination. Please consult with SUEZ at the time of purchase order (PO) preparation on this.

shipping crate Information (estimated)

qty	description	dimensions (in.)	weight (lb.)
32	ZW500D 48M or 52M cassette crate	L=110 x W=89 x H=83	4,110

Notes:

- Only crates for membrane/cassette transport have been shown above to identify the largest and heaviest items that will need to be unloaded;
 - Smaller crates/skids will be used for hardware items (hanger arms, spool connection components, etc.).
- ☐ **handling** –ZW500D 48M membrane cassette frames are shipped and will arrive on-site on their sides. An eye bolt kit, included in this proposal, should be used to safely turn the cassette(s) upright. Adequate work area and height and equipment will also be needed to be available to safely turn the cassettes upright for installation.
- ☐ **availability** - Delivery of membrane modules and LEAPmbr cassettes is typically 10 - 20 weeks after receipt of order. Definitive availability will be confirmed once a purchase order is received from Riverside and acknowledgement of a purchase order is issued by SUEZ.

6 SUEZ support

6.1 off-site support

project management

Develop project execution schedule with Riverside and provide planning and off-site assistance throughout the membrane expansion project. Coordinate blower installation contractor activities.

controls

Provide system controls programming adjustments as required for the new membranes including adjustment of set points for permeate and air flow.

documentation

SUEZ will develop a documentation update which will include the following scope:

- ☐ **O&M manual** - Provide a fully updated version of the operation & maintenance manual that indicates the changes made with this membrane expansion upgrade.
- ☐ **P&IDs** - Update the process (piping) & instrumentation drawings and reissue electronically.
- ☐ **electrical drawings** – Update the electrical drawings and reissue electronically.
- ☐ **controls documents** – Update control narrative (CN), controls logic sequence chart (CLSC, also known as CSC) and the operation sequence chart (OSC)

6.2 on-site technical services

The proposal includes a provision for technical services during installation and commissioning process to Riverside's staff as outlined in section 2. SUEZ requires that Riverside have at least two personnel on site working alongside the SUEZ FSR during this period for membrane relocation and installation activities.

The following activities will be executed and completed jointly by SUEZ personnel and plant staff:

- ☐ relocate existing membrane modules/cassettes;
- ☐ install the new membrane modules/cassettes;
- ☐ upload required revisions to the PLC program with adjusted set-points;
- ☐ perform bubble test to confirm membrane integrity and adjust/repair as required and
- ☐ review trans membrane pressure (TMP) on the installed membranes and compare to expected values for new membranes.

operating responsibility - Riverside retains control of the work site and retains final responsibility for the installation and commissioning process.

SUEZ will perform the services specified in the scope section of this document, but SUEZ will not operate the system. For the purposes of this agreement, the term “operate the system” shall mean to run or control the functioning of the equipment or to otherwise conduct or manage the affairs of any aspect of water or wastewater treatment or other functions at Riverside’s site, and shall include functions such as providing operators or laborers to adjust or control water treatment (“WT”) equipment, wastewater treatment (“WWT”) equipment or sludge management facilities (“SWF”), providing program oversight or directing on-site or contract operators/laborers to adjust or control WWT or SMF, providing personnel responsible for or providing oversight of water treatment residual quality, wastewater effluent quality, sludge quality, waste characterization, or waste disposal activities, or providing personnel with continual or daily operational responsibilities with respect to water or wastewater treatment, influent or effluent compliance monitoring, process monitoring, government reporting or notification, or permit compliance.

waiting time - Any overtime or waiting times required due to unforeseen site events outside the control of SUEZ will be brought to the attention of the City and may be invoiced according to the prevailing SUEZ service labor rates sheet, available on request.

reporting - Before leaving site, SUEZ will record observations and discuss with operators concerning the condition of the equipment, tasks accomplished during the visit, and key operating and maintenance issues requiring further attention. SUEZ will provide a copy of a written report before leaving site and/or provide a service visit report to the plant operator within a reasonable timeframe of the SUEZ service representative’s return to the office. In any case, Riverside will be asked to sign a work order that describes the hours on site and tasks accomplished.

SUEZ duties for on-site services

- ☐ SUEZ will coordinate its work under this agreement in a reasonable manner with the operating staff of the facility.
- ☐ SUEZ will maintain public liability and property damage insurance covering all operations undertaken by SUEZ and its sub-contractors with a limit of \$5,000,000 inclusive for any one accident or occurrence.
- ☐ SUEZ will maintain insurance coverage for Property in the Course of Construction and Inland Transit insurance in the amount equal to the materials and equipment

scheduled on SUEZ's Scope to protect against losses to the scheduled materials and equipment while in transit to the City facility and while being installed.

- ☐ SUEZ will maintain workers compensation and employers' liability coverage as per statutory requirements.

6.3 blower installation

Pricing has been included in the proposal for installation of the spare blower. Installation and testing of the blower will be completed by a 3rd party contractor provided by SUEZ. SUEZ will provide offsite direction to the 3rd party contractor and if Riverside deems necessary, provide on-site supervision for same. The following scope will be completed by the 3rd party contractor:

- ☐ mechanical installation of spare blower on existing concrete pad.
- ☐ inlet and outlet S10 SS piping, including pipe supports and wall penetration where required.
- ☐ pipe insulation to match existing.
- ☐ electrical connections for blower.
- ☐ start up and test.

7 scope - Riverside

7.1 installation preparation

- ☐ Receive, off-load, handle and provide temperature-controlled storage of the equipment and materials required for Seller to perform the duties outlined in the Seller's scope of supply. Prior to off-loading, Buyer to confirm temperature indicators have not been tripped.
- ☐ Membranes must be stored in a sheltered area, protected from freezing, direct sunlight or extreme heat, and sealed as shipped until ready for use. Storage should be in a dark, dry, level area at a temperature of 5-30°C (41-86°F). Membranes have a shelf life of 1 year before requiring re-preservation and should not be stored longer than necessary prior to installation. Riverside is responsible for risk of loss of Seller's parts while in storage at the customer's plant.
- ☐ Inspect, evaluate and make repairs as required for the membrane tanks, mounting brackets, hoses and all connections prior to SUEZ arriving at site.
- ☐ Provide all access structures (such as scaffolding) and mechanical lifting equipment including cranes, forklifts and scissor lifts.
- ☐ Assure availability of a copy of the operating manual, all process and instrumentation drawings, and all electrical drawings on site and accessible for reference.

- ☐ Maintain adequate insurance coverage for the risks of fire, theft, vandalism, floods and personal injury to authorized or unauthorized visitors.

7.2 installation

- ☐ Provide 2 or more plant personnel to work continuously with the SUEZ service representative during installation and commissioning of the modules for the full duration of the site visit.
- ☐ Riverside will afford Seller's personnel free access and egress of the facility for all authorized work. Riverside will provide reasonable access to workshop facilities with standard workshop tools and equipment as is necessary to meet any repair and maintenance requirements of the system during installation.
- ☐ Provide adequate illumination and emergency lighting for all areas in which the Seller will be executing the scope of supply. Provide all site utilities such as raw water, instrument quality air, potable water and power required for operation of the proposed equipment included in this scope of supply. Assure that adequate quantities of membrane cleaning and neutralizing chemicals are on hand for wash procedures including sodium hypochlorite, sodium bisulphite, citric acid and sodium hydroxide. Supply telephone/fax/modem access while Seller's staff members are on-site.
- ☐ Provide assistance to consolidate existing cassettes in order to leave two trains open for the new cassettes.
- ☐ Provide assistance to place the new cassettes into the system. Includes unpackaging, installation of leveling pins, hanger arms and aeration and permeate connections.
- ☐ Dispose of shipping and packaging materials unless specifically requested not to do so by SUEZ.
- ☐ Any updates to plant SCADA required to match SUEZ PLC/HMI updates.

duties

- ☐ Riverside will grant SUEZ personnel full and immediate access to the equipment and will make chemicals, plus specialized chemical handling equipment, water, lighting and electrical service available.
- ☐ Riverside will keep a copy of the operating manual, all process and instrumentation drawings, and all electrical drawings on site and accessible for reference.
- ☐ Riverside will arrange that plant personnel are available to collaborate with the SUEZ Service Representative for the full duration of this site visit.
- ☐ Riverside will assure that adequate quantities of membrane cleaning and neutralizing chemicals are on hand for wash procedures including sodium hypochlorite, sodium bisulphite, citric acid and sodium hydroxide.
- ☐ At the end of the site visit, prior to departure of the SUEZ Service Representative, Riverside will sign a work order that describes the hours on site and tasks accomplished.

8 solution design notes

8.1 permits

regulatory requirements

Riverside is responsible to review and report to the permit granting agency on the impact of any of the proposed changes on the regulatory permit. SUEZ will provide the necessary manufacturer's technical support on regulatory issues.

Please speak with your regional lifecycle manager (RLM) if there are any regulatory requirements or concerns.

utilization

SUEZ understands that these modules are intended as expansion modules to increase the plant annual average flow capacity from 26.0 MGD to 33.5 MGD modules.

It is SUEZ's understanding that cassette support beams are already installed in spare space. Customer needs to inform SUEZ if otherwise. There will be additional cost if these items are not already installed.

8.2 maintenance notes for replacement membranes

preferential flow

Preferential flows can create a risk of over-fluxing of new modules when they are installed in the same train with older modules. The mixing of old and new modules in the same cassette also makes management of slack adjustment more difficult. SUEZ recommends that Riverside plan membrane module replacement on a complete cassette and complete train basis wherever possible to achieve both optimal performance and best value from the new membrane modules.

With all the new cassettes installed in only 2 trains, preferential flow will be minimized.

membrane slack

SUEZ's membranes are supplied and shipped with an initial factory fiber slack designed to optimize membrane air scouring during operation as well as accommodate a degree of shrinkage. Membranes shrink in length early in their lifecycle when exposed to higher temperature water. The pace of shrinkage slows with age. With the installation of new membranes, the requirements for slack adjustment start a new cycle.

Due to the wide variety of operating environments in which our products can be utilized, it is difficult to generally predict the rate of shrinkage. If membranes operate in a condition of insufficient slack for an extended period of time, irreversible damage to the fiber-urethane bond may occur. Please refer below to the recommended inspection frequencies based on your plant's membrane tank operating temperature. Visual inspections should begin during the membrane installation and be repeated over time on the same cassette. Digital pictures will allow for comparative analysis of the fiber slack over time.

maximum operating temperature	recommended slack inspection frequency
0-24 °C / 32-76 °F	every 2 years
25-30 °C / 77-86 °F	once per year
>30 °C / > 86 °F	twice per year

bubble test pressure

The bubble test pressure for the purchased membranes is 2 psi horizontally and 3 psi vertically.

8.3 technical

MLSS concentration

MLSS concentration in the membrane tank during annual average, max month, and max week flows must not exceed 10 g/L and during max day and peak hour flows must not exceed 12 g/L.

biological system

Biological, pre and post treatment system expansion design, including equipment, will be completed by Riverside or their 3rd party designate.

pre-screen

Trash and non-biodegradable solids, such as hair, lint, grit and plastics may foul or damage the membranes if allowed to pass into the membrane chamber. SUEZ recommends that an internally-fed screen with mesh or punched-hole openings less than or equal to 2 mm with no possibility of bypass or carryover be operated upstream of the new membranes to ensure effective operation and to maximize membrane life.

9 health & safety

Riverside

- ☐ Riverside will identify and inform Seller's personnel of any site specific hazards present in the work place that could impact the delivery of Seller's scope of supply and agrees to work with Seller to remove, monitor, and control the hazards to a practical level.
- ☐ Riverside will provide training to Seller's personnel on all site specific and standard company operating procedures and practices for performing work on site. Such training programs may include, but are not limited to, general environmental health & safety (EHS), HAZOP, fire protection, drug testing, incident notice, site conduct, standard first aid, chemical receiving, electrical safety, etc. Riverside will provide a certificate of training for Seller's personnel. This program will be fully documented, training materials will be provided, and attendance list will be kept.
- ☐ If any type of lifting devices will be used on site, Riverside will provide proof of its maintenance, inspection and certification documentation upon request and will assist the SUEZ service representative to complete a safety inspection checklist.

- ☐ Where confined space entry may be required, Riverside will provide early notice and will collaborate with SUEZ in planning adequate staffing and in advising the local fire/rescue department as required.
- ☐ No time or cost provision has been made for preparations such as safety record clearances, drug testing, insurance confirmations or pre-job-training in excess of 1 hour. Prior to finalizing the Purchase Order and the work schedule, Riverside will advise SUEZ of any pre-job or pre-mobilization requirements. Where these requirements exceed 1 hour, this time will be charged to Riverside at rates set out in the prevailing SUEZ labor rate sheet.
- ☐ Where certain short duration activities require two people for safety and the SUEZ Service representative is alone at site, Riverside will cooperate as required to assure that correct safety precautions are taken.
- ☐ Riverside is responsible for the following environmental provisions:
 - environmental use and discharge permits for all chemicals at Riverside's facility either listed in this document or proposed for use at a later date;
 - any special permits required for Seller's or Riverside's employees to perform work related to the water treatment system at the facility;
 - all site testing, including soil, ground and surface water, air emissions, etc.;
 - disposal of all solid and liquid waste from the Seller's system including waste materials generated during construction, start up and operation.
- ☐ Riverside is responsible for provision of health and safety facilities to Seller's field service representatives to the same extent that they are provided to Riverside's own employees, including provision of:
 - eyewash and safety showers in the water treatment area;
 - chemical spill response;
 - security and fire protection systems per local codes;

SUEZ

- ☐ All work on site will be performed in accordance with applicable law and will be performed reasonably, in a clean and safe manner. The SUEZ service representative will abide by the more stringent of the applicable health, safety and environmental policies and procedures of either Riverside or SUEZ.
- ☐ SUEZ will provide all applicable safety training required by SUEZ policies or by state or national health and safety regulations. The SUEZ service representative will have undergone workplace hazardous material information system (WHMIS) training and will come equipped with necessary personal protective equipment (PPE).
- ☐ Emergencies - In emergencies affecting the safety of persons, work or property at the site and adjacent thereto, SUEZ will act, without previous instructions from Riverside, as the situation warrants. SUEZ will notify Riverside immediately thereafter.

10 Seller's warranty - ZeeWeed membrane module

2 + 8 prorated replacement

This schedule sets out the warranty with respect to ZeeWeed membrane modules ("membrane modules"). No other warranties, expressed or implied are made in connection with the sale of these products, including, without limitation, warranties as to fitness for any particular purpose or use or merchantability of these products. The warranty provided herein will be the exclusive and sole remedy of Buyer, and in no event will the Seller be liable for any special, direct, indirect or consequential damages, including, without limitation, loss of profits. This warranty is not transferable.

1 product

This warranty applies to only the membrane modules supplied under the contract of sale. Membrane module means the fibers and the potted plastic headers. This warranty does not cover air piping to the membrane module, permeate piping from the membrane module, piping connection fittings, connecting hardware and cassette frames with their associated components including but not limited to spacers, aerator tubes, aerator assemblies, screen, module dummies or module blanks.

Identification: membrane modules are shipped by the Seller with a serial number identification which confirms their place in the cohort set of membrane modules covered by this membrane module warranty.

2 Seller

ZENON Environmental Corporation is the name of the Seller, and means a business component of, or legal entity within the SUEZ Water Technologies & Solutions business (SUEZ) which is selling ZeeWeed modules and is the Seller offering this warranty. The Seller may assign this warranty to other SUEZ affiliates.

3 Buyer

Buyer means City of Riverside, California.

4 project

Project means the membrane modules sold under this proposal number 225109-5.

5 contract of sale

Contract of sale means the sales contract governing the sale of membrane module(s) for the project between Buyer and the Seller or its SUEZ affiliate.

6 scope of warranty

The Seller warrants that its membrane module(s) will be free of defects due to faulty materials or errors in manufacturing workmanship.

Regular membrane module inspection and normal fiber repair shall be the responsibility of Buyer.

All replacement membrane modules will be shipped on the basis of INCOTERMS 2010 FCA SUEZ manufacturing facility.

All ancillary costs including but not limited to bagging, boxing, crating, freight, freight insurance, applicable taxes, import duties, certifications, brokerage, receiving, forklift services, storage at site, reattachment hardware, hose/clamp/camlock replacement, crane services, installation, fiber repair materials, glycerin flushing, commissioning and waste disposal are the responsibility of Buyer.

full replacement – Full replacement means that in the case of a valid warranty claim for a membrane module failure, Buyer receives a replacement membrane module and does not pay for the value of use of the membrane module prior to failure.

prorated replacement – Prorated replacement means Buyer pays for actual use of a membrane module from which Buyer has derived value over time. Prorated replacement allows the Seller to pay reasonable compensation under warranty for any product use not enjoyed by Buyer due to premature failure.

The ratio of full replacement to prorated replacement in this warranty is set out in Item 8 of section 10.

7 warranty start date

For the original membrane modules in a plant, this membrane warranty will start on the earlier of:

- a. The date that installation of the original membrane module(s) has been substantially completed, or
- b. Six months from the date of shipment of the original membrane module(s) to Buyer.

For replacement or expansion membranes, this membrane warranty will start on the earlier of:

- a. The date of installation, or
- b. 1 month from the date of delivery to site.

8 warranty duration

total warranty duration: a total of 120 months composed of a base period and an extended period.

base period with full replacement: 24 months

All purchasers of ZeeWeed membrane modules are entitled to this base period of full replacement warranty coverage without purchasing an extended Seller's warranty.

extended period with full replacement: a total of 96 months following the base period

Replacement membrane modules are covered by warranty only to the extent of the warranty of the original membrane module which has been replaced. At all events, this warranty shall expire and be of no force or effect 120 months following the warranty start date.

9 notification of claim

All claims filed under this warranty shall be made in writing by Buyer within 30 days of identifying a defect.

Buyer shall provide the following information:

- a. A description of the defect giving rise to the claim;
- b. Photographs showing the manufacturing defect;
- c. The serial number(s) of the membrane module(s) which is (are) the subject of the warranty claim; and
- d. Operating data and repair history for the life of membrane modules which are the subject of a warranty claim.

10 verification of claim

After receipt of written notification of a defect, the Seller will promptly undertake such investigations as, in the Seller's opinion, are necessary to verify whether a defect exists. The Seller reserves the right to require additional data as necessary to validate claims. Buyer may, in the course of these investigations, be requested to return membrane module(s) to the Seller for examination. The Seller may also conduct reasonable tests and inspections at Buyer's plant or premises. If the results of the investigation do not validate the defect claimed, Buyer will reimburse the Seller for all reasonable expenses associated with said investigation, including expenses for all tests, inspections, and associated travel.

11 satisfaction of claims

The Seller will have the right to satisfy claims under this warranty in a flexible manner. Such flexibility may include the repair of existing membrane modules or changes in operating protocols or membrane module replacement or by upgrading failed membrane modules with newer membrane module(s) that may embody design and efficiency improvements. Buyer consents to the supply of replacement membrane modules which may be of a different design than original membrane modules. All work by Seller necessary to satisfy a verified claim shall take place within a commercially reasonable time in order to minimize the Buyer's loss of use of the equipment to the maximum extent possible.

12 membrane module replacement price – prorated warranty

The base Membrane Module Replacement Price (MMRP) used to calculate the prorated amount to be paid by the Buyer to replace defective Membrane Modules under warranty shall be **USD\$ 950.00** + adjustment for inflation. The inflation adjustment will be calculated according to changes in the Consumer Price Index, US City Average, All Urban Consumers, All Items less Food and Energy, as published by the US Bureau of Labor Statistics, + one (1.0) percent for the period from **January 1st, 2020** through to the latest available CPI Index report.

For Membrane Modules supplied under valid warranty claims, the prorated share that the Buyer will pay is calculated as follows:

Prorated Share of Price	=	Number of whole months elapsed between the Membrane Module Replacement Date & the Warranty Start Date	Membrane Module Replacement Price	X	Changes in CPI Index + 1.0%
		Warranty Duration in Months			

Note - This Membrane Module Replacement Price (MMRP) is not applicable for Membrane Modules requested for purchase by Buyer for any non-warranty or other purposes, including but not limited to flux reduction, or plant hydraulic capacity increases. Modules purchased under these or other scenario's will be sold to Buyer by Seller at the list price in effect at the time of order.

13 operating information

To maintain the membrane module warranty, membrane system operation records from initial start-up date until claim must be maintained by Buyer and made available to the Seller upon request. Records must be provided in sufficient detail to verify uninterrupted compliance with the Seller's operations and maintenance manual prepared by the Seller and supplied to Buyer as part of the contract. At a minimum, operation data must include information on feed water quality, temperatures, flows, trans-membrane pressures, aeration rates, permeate quality, cleaning intervals, cleaning chemical concentrations, elapsed time since start-up, relevant analytical data and reporting of any screen bypass events.

Buyer shall maintain and share access to a single reference copy in electronic form of a membrane module map containing the history of activity by membrane module. Buyer shall log its procedures performed related to a membrane module including relocation of membrane modules, repairs, replacements and any other noteworthy events.

Buyer authorizes the Seller to conduct any reasonable review of operation and maintenance records or to inspect facilities where membrane modules are installed, upon reasonable notice to Buyer. Such reviews and/or inspections are intended to also assist the Seller and Buyer in detection of membrane system faults and to optimize the care and operation of the membrane modules.

14 limitation of warranties

Occurrence of any of the following as reasonably determined by the Seller will void this warranty:

- A material failure to operate the membrane system in accordance with Seller's operations and maintenance manual supplied to Buyer as part of the contract, including material failure to adhere to the Seller's specified membrane module cleaning procedures and the use of anything other than Seller-approved membrane module cleaning agents.
- Failure to adhere to the preventive maintenance program as presented in the Seller's operations and maintenance manual, in published product manuals and in specifications.
- Failure to adhere to all transportation and module storage recommendations outlined by Seller.
- Failure to ensure correct operation and/or functioning of the screening equipment.
- Introduction of destructive foreign materials into the membrane module tanks. Destructive foreign materials may include natural or human-made materials that are introduced into the membrane system influent channel or tanks originating from construction and maintenance activities or from inadequate pretreatment or from aquatic species including clams and snails or from damage to the tank or tank coating. Buyer shall be responsible to maintain correct function of the screen mechanism, to flush accumulated grit from the tank bottom and to flush accumulated foreign materials from the membrane modules.
- Failure to install and maintain operating data acquisition and electronic data transmission functions at the plant.
- Physical abuse or misuse, incorrect removal or installation of membrane modules by non-Seller personnel including fiber damage caused by operator error in handling of membrane modules or cassettes.
- Unauthorized alteration of any components or parts originally supplied by the Seller.
- Intentional damage.

15 return procedure

In the event that the return of a membrane module is required pursuant to this warranty, Buyer will first obtain a return goods authorization (RGA) number from the Seller. Membrane module(s) shipped to the Seller for warranty examination must be shipped freight prepaid. If Buyer desires temporary replacement membrane module(s) to replace those alleged to be defective and returned to the Seller for warranty examination, Buyer shall be responsible for the cost associated with any such replacements until examination of the returned membrane modules pursuant to this warranty is complete. Any membrane module examined by Seller as part of a warranty claim where the membrane module is subsequently found to be performing as warranted or where a membrane module failure is not covered under the warranty will be returned to Buyer, freight collect.

11 terms and conditions of sale

a - specific terms and conditions of sale

These terms take precedence over the general terms and conditions of sale.

1 legal entity for contracting

ZENON Environmental Corporation is the name of the Seller, and means a business component of, or legal entity within the SUEZ Water Technologies & Solutions business (SUEZ) which is selling ZeeWeed modules.

Please advise us if this SUEZ entity is not set up in your purchasing system as a vendor and you do have another SUEZ entity set up. We are keen to make the purchase process as convenient as possible for Riverside.

short form: Where a short reference is required in this document, for convenience, we are called simply **SUEZ**.

2 payment terms

On **approved credit**, payment terms are net 30 days from customer receipt of invoice. Please see the invoicing schedule in the price section.

3 proposal validity

Prices quoted and proposal terms are valid up to thirty (30) days after the date of issue of this proposal unless confirmed with a purchase order.

4 bonds

Performance or payment bonds are not included in the price. These bonds can be purchased on request but will be at an additional cost.

5 flight booking

Prices quoted for installation which include airfare are either based on timely confirmation of a visit schedule or based on receipt of a purchase order in time to book any flights seven days in advance. Additional airfare charges related to late arrival of a purchase order will be extra and billed through to Riverside without mark-up.

6 warranty on programming

SUEZ warrants that the PLC program will conform to the specifications in the relevant sections of the CLSC and OSC (revised for the project) and will be free from defects in workmanship when operated at all times in accordance with SUEZ's written instructions. If any defects are found and reported by Riverside within a period not exceeding twelve (12) months beyond the completion of the site acceptance test, SUEZ will make modifications to the PLC code as deemed necessary. Any changes requested by Riverside after this period will be at the customer's expense.

7 purchase order guidelines

Please ensure that your purchase order has covered the following points. This will ensure accurate and prompt order entry, product delivery, invoicing and accounts receivables processing and will prevent administrative delays for all parties.

- ☐ **legal entity** – Please be sure your purchase order is issued in the name of the specific SUEZ legal entity issuing this proposal cited above. We will be glad to work with your purchasing department to set this entity up as an approved supplier/vendor. Please advise us if this SUEZ entity is not set up in your purchasing system as a vendor and you do have another SUEZ entity set up.
- ☐ **hard copy** – Our strong preference is to receive a hard copy of your purchase order rather than a PO number alone.
- ☐ **proposal number and date** – Please reference the 6-digit proposal number and the proposal date which are found in the footer of each page.
- ☐ **price** – State the total price you are accepting for this order.

- ☐ **taxes** – Provide any required tax exemption certificates.
- ☐ **ship-to address** – Please clearly define the plant site address or delivery location and the receiver's email & telephone. Please specify receiving hours and any special off-loading requirements.
- ☐ **delivery date** – Please include your requested delivery date or agreement start date.
- ☐ **purchase order** – Please send your purchase order to SUEZ by email to service.pocentral.wts@suez.com.

b – general terms and conditions of sale

SUEZ's standard terms and conditions apply. See attachment a.

Note to purchasing agent: The SUEZ's standard set of commercial terms & conditions are written for moderate value transactions to allow an efficient and rapid provision of services and parts. Where corporate agreement terms have been previously agreed, these may be brought forward by either party and applied by mutual consent. If either of these terms sets are not immediately acceptable, please expect a typical 6-10 week cycle of mutual review to build agreement on changes.

12 signed agreement

Through the issue of this proposal, SUEZ signals their intent to enter into an agreement with Riverside. Riverside and SUEZ acknowledge that they have read and understood this agreement and agree to be bound by the terms and conditions specified in it.

offered by legal entity: ZENON Environmental Corporation, also known as SUEZ or Seller

accepted by legal entity: City of Riverside, California also known as Riverside or Buyer

authorized signature by:

DAVID BINGHAM

authorized signature by:

title: COMM. DIRECTOR

title:

signature date:

JUNE 16 2020

signature date:

signature:

X

signature:

X

purchase order no:

service.pocentral.wts@suez.com

or

SUEZ Water Technologies & Solutions

attention: Contracts Administrator

Please contact

service.pocentral.wts@suez.com
for correct address

or

fax no.: 905 465 3030

Upon acceptance of this proposal, please forward the following either

• by email with .pdf attachments or • by postal mail or • by fax.

1) this signature page completed

to:

2) a hard copy of your purchase order, and

3) any required tax exemption certificates

This agreement comes into force when SUEZ has issued a formal acceptance of Riverside's Purchase order or formal acceptance of this Riverside signed agreement.

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CERTIFIED AS TO FUNDS AVAILABILITY:

BY:

[Signature]
Chief Financial Officer/Treasurer

Approved as to Form:

By:

[Signature]

Ruthann M. Salera
Deputy City Attorney

attachment a SUEZ standard terms and conditions

general terms and conditions of sale

1. **exclusive terms and conditions.** Together with any other terms the Parties agree to in writing, these General Terms and Conditions – together with the last proposal in order of time issued by the Seller – form the exclusive terms ("Agreement") whereby Buyer agrees to purchase, and Seller agrees to sell products and equipment (jointly "Equipment") and to provide advice, instruction and other services in connection with the sale of that Equipment ("Services"). If Buyer sends to Seller other terms and conditions to which Seller may not respond, including but not limited to those contained in Buyer's purchase order, such shall not apply. This Agreement may only be revised by a change order approved in writing by both Parties. All terms not defined herein shall be defined in Seller's proposal.
2. **equipment and services.** The Equipment to be delivered and the Services to be provided shall be as set out in this Agreement. Unloading, handling, storage, installation, and operation of Buyer's systems or the Equipment are the responsibility of Buyer. Buyer shall not require or permit Seller's personnel to operate Buyer's systems or the Equipment at Buyer's site.
3. **prices and payment.** Buyer shall pay Seller for the Equipment and Services in accordance with the payment schedule (as set forth in Seller's proposal or, if applicable, in any special conditions agreed to in writing by the Parties). Unless otherwise specified in writing, payment is due net thirty (30) days from the date of Seller's invoice. Seller may require a Letter of Credit or other payment guarantee, in which case the stated amount of the guarantee will be adjusted by Buyer in the event of any currency-based adjustment to prices or payment amounts per the Payment Schedule, and Buyer shall deliver the adjusted guarantee within five (5) days of request by Seller. Buyer agrees to reimburse Seller for collection costs, including 2% (two percent) interest per month (not to exceed the maximum amount permitted by applicable law), should Buyer fail to timely pay. Buyer shall have no rights to make any deduction, retention, withholding or setoff relating to any payments due under this Agreement.
4. **taxes and duties.** Seller shall be responsible for all corporate taxes measured by net income due to performance of or payment for work under this Agreement ("Seller Taxes"). Buyer shall be responsible for all taxes, duties, fees, or other charges of any nature (including, but not limited to, consumption, gross receipts, import, property, sales, stamp, turnover, use, or value-added taxes, and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto, imposed by any governmental authority on Buyer or Seller or its subcontractors) in relation to the Agreement or the performance of or payment for work under the Agreement other than Seller Taxes ("Buyer Taxes"). The Agreement prices do not include the amount of any Buyer Taxes. If Buyer deducts or withholds Buyer Taxes, Buyer shall pay additional amounts so that Seller receives the full Agreement price without reduction for Buyer Taxes. Buyer shall provide to Seller, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes. Buyer shall furnish Seller with evidence of tax exemption acceptable to taxing authorities if applicable, prior to execution of the Agreement by both Parties or issuance by the Seller of the order acceptance. Buyer's failure to provide evidence of exemption at time of order will relieve Seller of any obligation to refund taxes paid by Seller.
5. **delivery, title, risk of loss.** Unless otherwise specified in this Agreement, Seller shall deliver all Equipment to Buyer FCA (Incoterms 2010) Seller's facility. The time for delivery of the Equipment to Buyer shall be specified in this Agreement. Seller's sole liability for any delay in delivery of the Equipment shall be as expressly set out in this Agreement. The place of delivery specified herein shall be firm and fixed, provided that Buyer may notify Seller no later than forty-five (45) days prior to the scheduled shipment date of the Equipment of an alternate point of delivery. Buyer shall compensate Seller for any additional cost in implementing the change. If any part of the Equipment cannot be delivered when ready due to any cause not attributable to Seller, Buyer shall designate a climate-controlled storage location, and Seller shall ship such Equipment to storage. Title and risk of loss shall thereupon pass to Buyer and amounts payable to Seller upon delivery or shipment shall be paid by Buyer along with expenses incurred by Seller. Services provided herein shall be charged at the rate prevailing at the time of actual use and Buyer shall pay any increase, and Buyer shall pay directly all costs for storage and subsequent transportation. Failure by Buyer to take delivery of the Equipment shall be a material breach of this Agreement.

Title and risk of loss to the Equipment shall be transferred from Seller to Buyer at the point of delivery upon handover in accordance with this Agreement. Title and risk of loss to the Services shall pass as they are performed.
6. **warranties and remedies.** Seller warrants that Equipment shall be delivered free from defects in material, workmanship and title and that Services shall be performed in a competent, diligent manner in accordance with any

mutually agreed specifications. Seller's warranty does not cover the results of improper handling, storage, installation, commissioning, operation or maintenance of the Equipment by Buyer or third parties, repairs or alterations made by Buyer without Seller's written consent, influent water which does not comply with agreed parameters, or fair wear and tear.

Unless otherwise expressly provided in this Agreement, the foregoing warranties are valid for:

- (a) chemicals and Services, for six (6) months from their date of delivery or the provision of Services;
- (b) consumables, including filters and spiral wound membranes (other than spiral wound membranes for process treatment), the earlier of twelve (12) months from date of first use or fifteen (15) months from their date of delivery;
- (c) spiral wound membranes for process fluid treatment, ninety (90) days from their date of first use;
- (d) ultrafiltration membranes (ZW500, ZW700B, ZW1000, ZW1500), twelve (12) months from their date of delivery;
- (e) Equipment other than chemicals and consumables, the earlier of, fifteen (15) months from delivery or shipment to storage, or twelve (12) months from start-up/first use;
- (f) software, ninety (90) days from the date of receipt;
- (g) Equipment not manufactured by Seller, the warranty shall be the manufacturer's transferable warranty only,

Any claim for breach of these warranties must be promptly notified in writing, and Buyer shall make the defective item available to the Seller, or the claim will be void. Seller's sole responsibility and Buyer's exclusive remedy arising out of or relating to the Equipment or Services or any breach of these warranties is limited to repair at Seller's facility or (at Seller's option) replace at Seller's facility the defective item of Equipment and re-perform defective Services. In performance of its obligations hereunder, Seller will not control the actual operation of either Buyer's systems or the Equipment at the Buyer's site. All work by Seller necessary to satisfy a verified claim shall take place within a commercially reasonable time in order to minimize the Buyer's loss of use of the Equipment to the maximum extent possible.

Warranty repair, replacement or re-performance by Seller shall not extend or renew the applicable warranty period.

The warranties and remedies are conditioned upon (a) proper unloading, handling, storage, installation, use, operation, and maintenance of the Equipment and Buyer's facility and all related system in accordance with Seller's instructions and, in the absence, generally accepted industry practice, (b) Buyer keeping accurate and complete records of operation and maintenance during the warranty period and providing Seller access to those records, and (c) modification or repair of Equipment or Services only as authorized by Seller in writing. Failure to meet any such conditions renders the warranty null and void.

The Buyer will be entitled to assign to a subsequent owner of the Equipment the warranties of the Seller under this Agreement, provided that a prior written notification is sent to the Seller and the assignment agreement contains terms and conditions which provide the Seller with the protections of the warranties and limitations on liability contained in the Agreement. Subject to Buyer's compliance with the foregoing requirement, such warranty rights are expressly assignable by the Buyer to a subsequent owner of the Equipment. Except as provided herein, Buyer is not entitled to extend or transfer this warranty to any other party. The warranties and remedies set forth in this article are in lieu of and exclude all other warranties and remedies, statutory, express or implied, including any warranty of merchantability or of fitness for a particular purpose.

Unless otherwise expressly stipulated in this Agreement, Seller gives no warranty or guarantee as to process results or performance of the Equipment, including but not limited to product quality, flow, production, capacity, membrane life, chemical consumption, regulatory compliance or energy consumption.

7. general indemnity. Seller shall indemnify and hold harmless Buyer from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of Seller or its officers, agents, employees, and/or assigns while engaged in activities under this Agreement. Buyer shall likewise indemnify and hold harmless Seller from claims for physical damage to third party property or injury to persons, including death, to the extent caused by the negligence of the Buyer, its officers, agents, employees, and/or assigns. In the event such damage or injury is caused by the joint or concurrent negligence of Seller and Buyer, the loss shall be borne by each Party in proportion to its negligence. For the purposes of this article (i) "Third party" shall not include Buyer or any subsequent owner of the Equipment, their subsidiaries, parents, affiliates, agents, successors or assigns including any operation or maintenance contractor, or their insurer; and (ii) no portion of the Equipment is "third party property".

8. compliance with laws and permits. All permits, authorizations, and licenses which are required to construct, install and/or operate Buyer's facility or equipment, to use the Equipment, or to manage and dispose of any wastes,

discharges, and residues resulting from Buyer's use of the Equipment, shall be obtained and maintained by Buyer at Buyer's sole expense. Buyer is responsible for compliance with all laws and regulations applicable to the storage, use, handling, installation, maintenance, removal, registration, and labeling of all Equipment after delivery of the Equipment, as well as for the proper management and disposal of all wastes, discharges, and residues.

9. buyer's site conditions. Buyer warrants that any data furnished to the Seller concerning conditions at Buyer's site (including but not limited to any existing Buyer facility, equipment or processes, influent water or other substances to be treated or measured with the Equipment) is accurate and complete, and the Seller reserves the right to utilize the most appropriate design compatible with generally accepted engineering practices, and to make changes in details of design, manufacture and arrangement of Equipment unless precluded by any limitations specified in this Agreement. Seller shall notify Buyer of (1) any conditions at Buyer's site which materially differ from those indicated in the data furnished by Buyer, (2) any previously unknown physical conditions at Buyer's site of an unusual nature, not revealed by previous investigations and differing from those ordinarily encountered in the type of work provided for in this Agreement, and (3) the presence of any Hazardous Materials (as defined below), the existence of a contaminated soil, unexploded ordinance, or archaeological remains. If such conditions cause an increase in Seller's cost or in the time required for the performance of Seller's obligations, Seller shall be entitled to an equitable adjustment in the Agreement price and an extension in the time for performance.

10. hazardous materials and wastes. In the event that Seller encounters any Hazardous Materials (meaning toxic substances, hazardous substances, pollutants, contaminants, regulated wastes, or hazardous wastes as such terms may be defined or classified in any law, statute, directive, ordinance or regulations promulgated by any applicable governmental entity) at Buyer's site, other than Hazardous Materials introduced by Seller or that are otherwise the express responsibility of Seller under this Agreement, Buyer shall immediately take whatever precautions are required to legally eliminate such Hazardous Materials so that the Seller's work under this Agreement may safely proceed. At no time shall Seller be deemed to have taken title to or the responsibility for the management or disposal of any wastes, Hazardous Materials, influent water, any resultant product streams, wastewater streams, discharges, cleaning materials, or any other materials or substances processed by the Equipment or otherwise located at Buyer's site. Seller does not take responsibility for and hereby expressly disclaims responsibility for the characterization or disposal of wastes, Hazardous Materials, or for the identification, selection, or management of disposal facilities for any wastes.

11. excusable delays. Seller shall not be liable nor in breach or default of its obligations under this Agreement to the extent performance of such obligations is delayed or prevented, directly or indirectly, due to causes beyond the reasonable control of Seller, including, but not limited to: acts of God, natural disasters, unusually severe weather, fire, terrorism, war (declared or undeclared) epidemics, material shortages, insurrection, act (or omissions) of Buyer or Buyer's contractors/suppliers or agents, any act (or omission) by any governmental authority, strikes, labor disputes, transportation shortages, or vendor non-performance. The delivery or performance date shall be extended for a period equal to the time lost by reason of delay or non-performance, plus such additional time as may be necessary to overcome the effect of the delay or non-performance. If delivery or performance is delayed for a period exceeding 180 (one hundred and eighty) days, either Party may terminate this Agreement without further liability provided that Seller shall be paid an amount equal to that which would be payable to Seller under the article entitled "Termination". If Seller is delayed by any acts (or omissions) of Buyer, or by the prerequisite work of Buyer's other contractors or suppliers, Seller shall be entitled to an equitable adjustment in schedule, price and/or performance, as applicable.

12. emergencies. If the safety of Seller's personnel is threatened or likely to be threatened by circumstances outside the reasonable control of Seller, including but not limited to war, armed conflict, civil unrest, riots, terrorism, kidnapping, presence of or exposure to hazardous materials, unsafe working conditions, or by the threat of such circumstances or a lack of adequate protections against such circumstances, Seller shall be entitled to take all necessary steps to ensure the security and safety of its personnel including the evacuation of personnel until such circumstances no longer apply. Any such occurrence shall be considered an excusable delay event. Buyer shall reasonably assist in the event of any such evacuation.

13. confidentiality, intellectual property. Both Parties agree to keep confidential the other Party's proprietary non-public information, if any, which may be acquired in connection with this Agreement, unless legally required to disclose, including in response to a request made under the California Public Records Act (California Government code sections 6250 et seq.). Buyer will not, without Seller's advance written consent, subject Equipment to testing, analysis, or any type of reverse engineering. Seller retains all intellectual property rights including copyright which it has in all drawings and data or other deliverables (including the Equipment) supplied or developed under this Agreement. Buyer agrees that it will not file patent applications on the Equipment or any development or enhancement of the Equipment, or of processes and methods of using the Equipment, without Seller's express prior written permission. Buyer further agrees that in any event any such patents will not be asserted against Seller or its other buyers based upon purchase and use of such Equipment. Seller grants to Buyer a non-exclusive, non-terminable, royalty free license to use the

intellectual property embedded in Equipment delivered to and paid for by the Buyer, as well as any drawings, design or data delivered to and paid for by the Buyer, for the purposes of owning, financing, using, operating and maintaining the relevant Equipment at Buyer's site. Such license may only be assigned to a subsequent owner of the Equipment or to an operations and maintenance subcontractor. Such license does not extend to the re-creation of the Equipment or the manufacture of spares or consumables by Buyer or third parties.

Any software Seller owns and provides pursuant to this Agreement shall remain Seller's property. Seller provides to Buyer a limited, non-exclusive and terminable royalty free project-specific license to such software for the use, operation or maintenance at Buyer's site of any Equipment purchased hereunder to which the software is a necessary component. Buyer agrees not to copy, sub-license, translate, transfer, reverse engineer, or decode the software.

Seller shall indemnify and hold harmless Buyer from any rightful claim of any third party that any Equipment or Service infringe a patent in effect in the USA, or country of delivery (provided there is a corresponding patent issued by the USA), or USA copyright or copyright registered in the country of delivery. If the Buyer notifies the Seller promptly of the receipt of any such claim, does not take any position adverse to the Seller regarding such claim and gives the Seller information, assistance and exclusive authority to settle and defend the claim, the Seller shall, at its own expense and choice, either (i) settle or defend the claim and pay all damages and costs awarded in it against the Buyer, or (ii) procure for the Buyer the right to continue using the Equipment or Service, or (iii) modify or replace the Equipment or Service so that it becomes non-infringing, or (iv) remove the infringing Equipment and refund the price. The above paragraph shall not apply to any misuse of Equipment or Equipment which is manufactured to the Buyer's design, or to alleged infringement arising from the combination, operation, or use of any Equipment or Services with other equipment or services when such combination is part of any allegedly infringing subject matter. The foregoing list of sub-sections (i), (ii), (iii), and (iv) and related terms state the entire liability of the Seller for intellectual property infringement by any Equipment or Service.

14. limitations on liability. Notwithstanding anything else contained in this Agreement, to the maximum extent permitted by law, and regardless of whether a claim is based in contract (including warranty or indemnity), extra-contractual liability, tort (including negligence or strict liability), statute, equity or any other legal theory:

- (a) THE TOTAL LIABILITY OF THE SELLER AND OF ITS INSURER FOR ALL CLAIMS ARISING OUT OF OR RELATING TO THE PERFORMANCE OR BREACH OF THIS AGREEMENT OR USE OF ANY EQUIPMENT OR SERVICES SHALL NOT EXCEED THE TOTAL PRICE PAID BY BUYER UNDER THIS AGREEMENT OR (IN THE CASE OF AN AGREEMENT FOR SERVICES WITH A TERM OF MORE THAN ONE YEAR) THE ANNUAL PRICE PAYABLE BY BUYER UNDER THIS AGREEMENT;
- (b) IN NO EVENT SHALL SELLER BE LIABLE FOR ANY LOSS OF PROFIT OR REVENUES, LOSS OF PRODUCTION, LOSS OF USE OF EQUIPMENT OR SERVICES OR ANY ASSOCIATED EQUIPMENT, INTERRUPTION OF BUSINESS, COST OF CAPITAL, COST OF REPLACEMENT WATER OR POWER, DOWNTIME COSTS, INCREASED OPERATING COSTS, CLAIMS OF BUYER'S CUSTOMERS FOR SUCH DAMAGES, OR FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE OR EXEMPLARY DAMAGES;
- (c) SELLER'S LIABILITY SHALL END UPON EXPIRATION OF THE APPLICABLE WARRANTY PERIOD, PROVIDED THAT BUYER MAY CONTINUE TO ENFORCE A CLAIM FOR WHICH IT HAS GIVEN NOTICE PRIOR TO THAT DATE BY COMMENCING AN ACTION OR ARBITRATION, AS APPLICABLE UNDER THIS AGREEMENT, BEFORE EXPIRATION OF ANY STATUTE OF LIMITATIONS OR OTHER LEGAL TIME LIMITATION BUT IN NO EVENT – TO THE EXTENT PERMITTED BY APPLICABLE LAW – LATER THAN FIVE (5) MONTHS AFTER EXPIRATION OF SUCH WARRANTY PERIOD.

For the purposes of this article, "Seller" shall mean Seller, its affiliates, subcontractors and suppliers of any tier, and their respective agents and employees, individually or collectively. If Buyer is supplying Seller's Equipment or Services to a third party, Buyer shall require the third party to agree to be bound by this article. If Buyer does not obtain this agreement for Seller's benefit for any reason, Buyer shall indemnify and hold Seller harmless from all liability arising out of claims made by the third party in excess of the limitations and exclusion of this article.

15. termination. This Agreement and any performance pursuant to it may be terminated by either Party, and the consequences of such termination shall be as set out in the next paragraph, if the other Party

- (a) becomes insolvent, makes an assignment for the benefit of its creditors, has a receiver or trustee appointed for the benefit of its creditors, or files for protection from creditors under any bankruptcy or insolvency laws; or

- (b) fails to make any payment when due or to establish any payment security required by this Agreement or commits a material breach or defaults in its material obligations under this Agreement, and such default is not cured within thirty (30) days of written notice from the other Party.

Upon the termination of this Agreement by Buyer for cause (i) Seller shall reimburse Buyer the difference between that portion of the Agreement price allocable to the terminated scope and the actual amounts reasonably incurred by Buyer to complete that scope, and (ii) Buyer shall pay to Seller (a) the portion of the Agreement price allocable to Equipment completed, and (b) amounts for Services performed before the effective date of termination. Upon the termination of this Agreement by Seller for cause Buyer shall pay to Seller within thirty (30) days of receipt of invoice the price of all Equipment or Services delivered at the date of termination, plus an amount equal to all costs and expenses incurred in the engineering, sourcing, financing, procurement, manufacture, storage and transportation of the Equipment including materials, work in progress and any cancellation charges assessed against Seller by Seller's suppliers including reasonable overhead and profit on all such costs and expenses. Alternatively, if any schedule of termination payments has been agreed between the Parties, Buyer shall pay to Seller within thirty (30) days of receipt of invoice the amounts set out in that schedule.

Seller shall have the right to suspend performance upon written notice to Buyer in any case where Seller would have the right to terminate the Agreement under this article, without prejudice to Seller's right to terminate this Agreement for cause. Any cost incurred by Seller in accordance with any such suspension (including storage costs) shall be payable by Buyer upon submission of the Seller's invoice(s). Performance of the Seller's obligations shall be extended for a period of time reasonably necessary to overcome the effects of such suspension.

16. governing law, dispute resolution. This Agreement shall be governed by the substantive laws of the State of California. In the event of a dispute concerning this Agreement, the complaining Party shall notify the other Party in writing thereof. Management level representatives of both Parties shall meet at an agreed location to attempt to resolve the dispute in good faith. Should the dispute not be resolved within thirty (30) days after such notice, the complaining Party may seek remedies through arbitration. The seat of arbitration shall be the federal district court closest to the Buyer and the rules of the arbitration will be the Commercial Arbitration Rules of the American Arbitration Association, which are incorporated by reference into this article.

Notwithstanding the foregoing, each Party shall have the right to commence an action or proceeding in a court of competent jurisdiction, subject to the terms of this Agreement, in order to seek and obtain a restraining order or injunction to enforce the confidentiality intellectual property provisions set forth in the first two paragraphs of article 13; nuclear use restrictions set forth in article 17, or to seek interim or conservatory measures not involving monetary damages.

17. no nuclear use. Equipment and Services sold by Seller are not intended for use in connection with any nuclear facility or activity, the Buyer warrants that it shall not use or permit others to use the Equipment or Services for such purposes, without the advance written consent of Seller. If, in breach of this, any such use occurs, Seller (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination, and, in addition to any other rights of Seller, Buyer shall indemnify and hold Seller (and its parent, affiliates, suppliers and subcontractors) harmless against all such liability.

18. export control. Seller's obligations are conditioned upon Buyer's compliance with all USA and other applicable trade control laws and regulations. Buyer shall not trans-ship, re-export, divert or direct Equipment (including software and technical data) other than in and to the ultimate country of destination declared by Buyer and specified as the country of ultimate destination on Seller's invoice.

19. changes. Each Party may at any time propose changes in the schedule or scope of Equipment or Services. All changes to the Equipment or Services shall be subject to mutual agreement via a written change order or variation, which shall only become effective once signed by both Parties. The scope, Agreement price, schedule, and other provisions will be equitably adjusted to reflect additional costs or obligations incurred by Seller resulting from a change, after Seller's proposal date, in Buyer's site-specific requirements or procedures, or in industry specifications, codes, standards, applicable laws or regulations. It shall be acceptable and not considered a change if Seller delivers Equipment (including Equipment replacement under warranty) that bears a different, superseding or new part or version number compared to the part or version number listed in the Agreement, provided that in no circumstance shall this affect any other of Seller's obligations including those set forth in article 6.

20. conflicts; survival, assignment. If there is any conflict between this Agreement and any written proposal or quotation provided by Seller, then the terms and conditions set forth in this Agreement shall prevail. If any term or condition of this Agreement or any accompanying terms and conditions are held invalid or illegal, then such terms and conditions shall be reformed to be made legal or valid, or deleted, but the remaining terms and conditions shall remain in full force and effect, and this Agreement shall be interpreted and implemented in a manner which best fulfills Parties'

intended agreement. Those provisions which by their nature remain applicable after termination shall survive the termination of this Agreement for any reason. Seller may assign or novate its rights and obligations under the Agreement, in whole or in part, to any of its affiliates or may assign any of its accounts receivable under this Agreement to any party without Buyer's consent, and the Buyer hereby agrees, by signing this Agreement, to such assignment and to execute any document that may be necessary to complete Seller's assignment or novation. This Agreement shall not otherwise be assigned by either Party without the other Party's prior written consent, and any assignment without such consent shall be void.

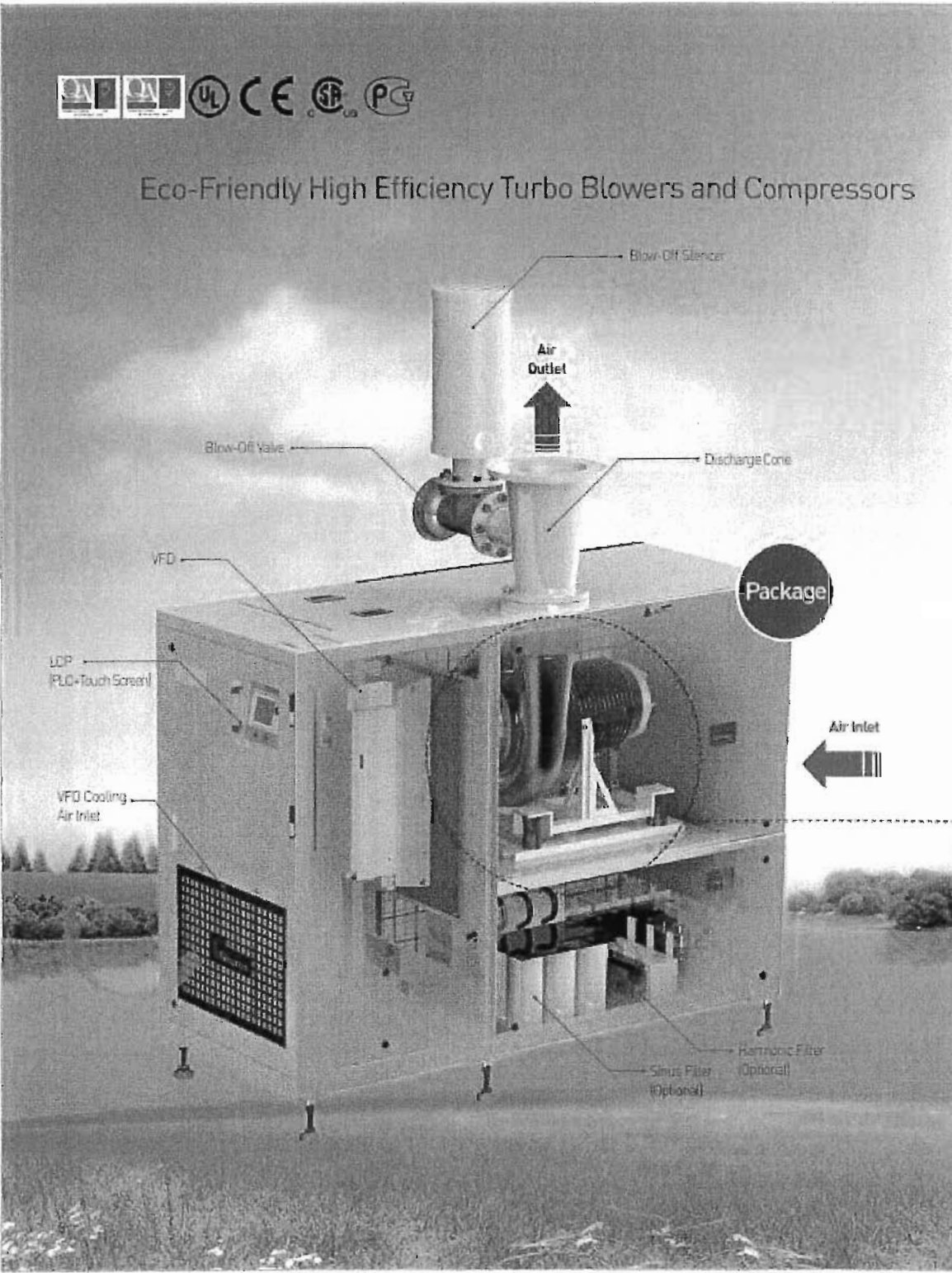
Seller may (i) manufacture and source the Equipment and any part thereof globally in the country or countries of its choosing; and (ii) may subcontract portions of the Services, so long as Seller remains responsible for such.

21. no third party beneficiary. Except as specifically set forth in the article entitled "Limitations on Liability" and "No Nuclear Use", this Agreement is not intended to, and does not, give to any person who is not a party to this Agreement any rights to enforce any provisions contained in this Agreement.

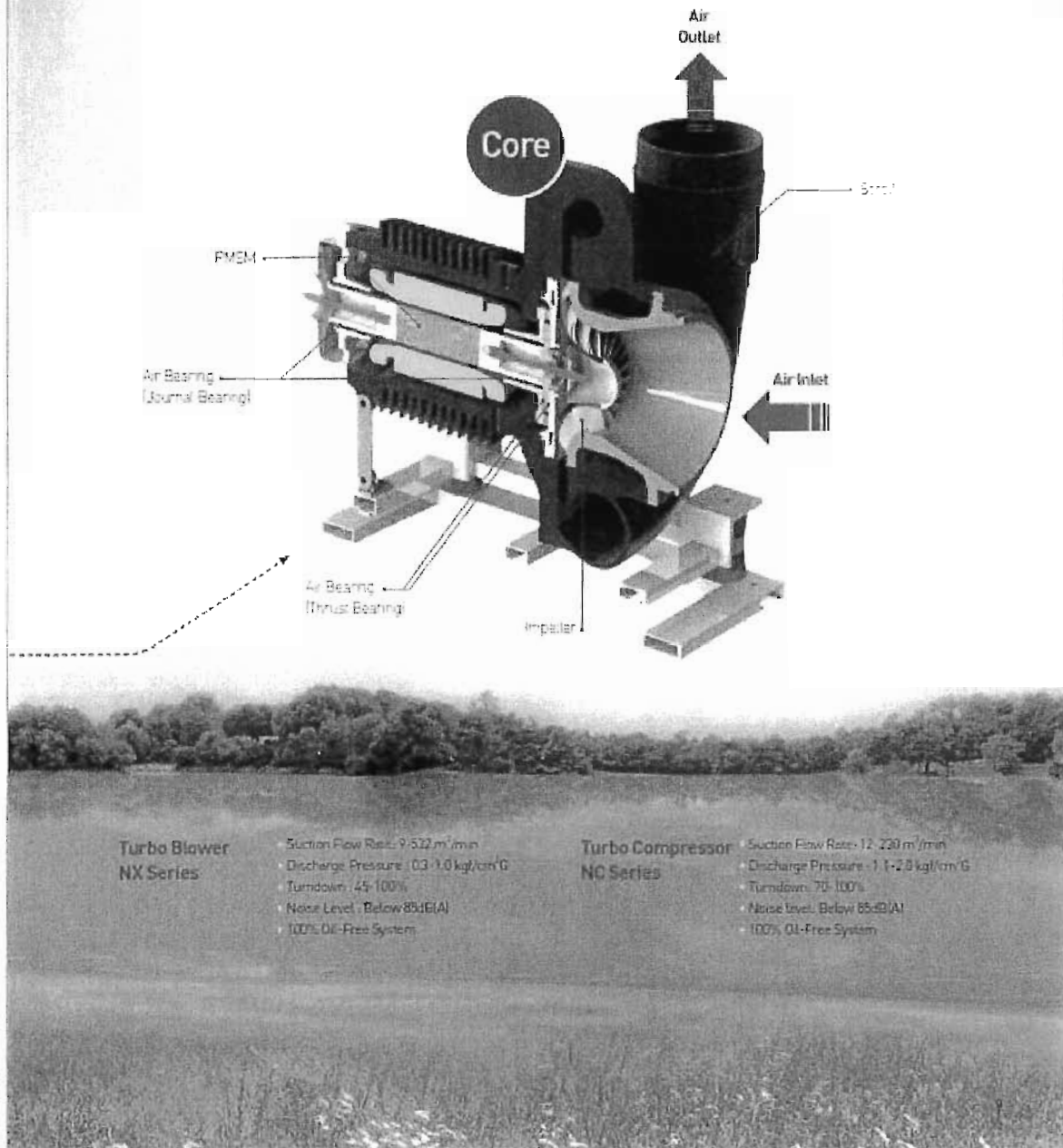
22. entire agreement. This Agreement embodies the entire agreement between Buyer and Seller and supersedes any previous documents, correspondence or agreements between them. No modification, amendment, revision, waiver, or other change shall be binding on either Party unless agreed in writing by the Party's authorized representative. Any oral or written representation, warranty, course of dealing, or trade usage not specified herein shall not be binding on either Party. Each Party agrees that it has not relied on, or been induced by, any representations of the other Party not contained in this Agreement

attachment b Neuros Turbo Blower NX300-C050 AG



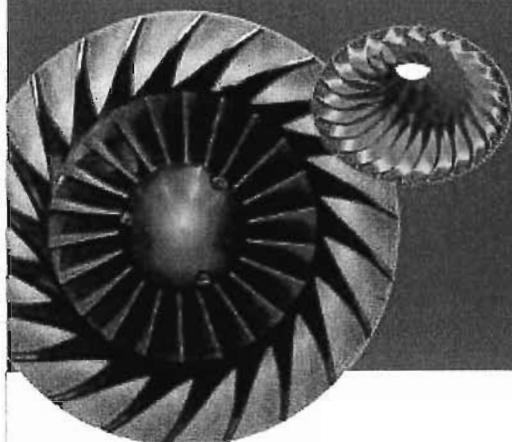


Are a Smart Choice for Mankind and the Environment



THE HIGHEST PERFORMANCE

The ultimate turbo machinery integrating the state-of-the-art aerospace high performance technologies.

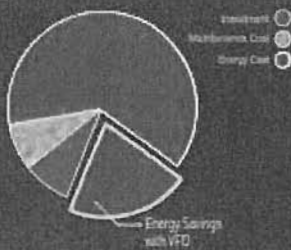
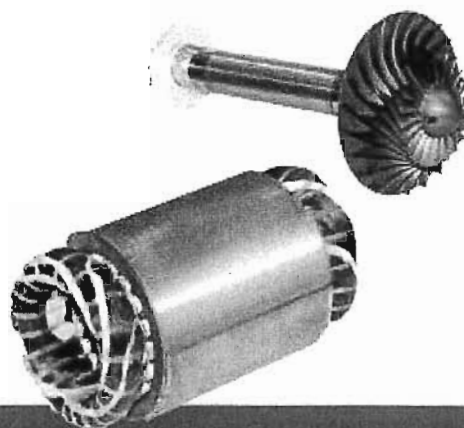


High Efficiency Impeller with Aerodynamic Optimization Design

- The design of the impeller and diffuser plays a key role in maximizing the efficiency of the turbo machinery.
- Impeller has higher integrity and higher fatigue life, as well as a larger diameter and precise impeller shape combined with optimal specific speed resulting in higher efficiency.
- Impeller's structural integrity is verified by a Spin Test at a rotational speed of 120%.
- Most suitable material, forged Aluminum Alloy, is used for the high-speed turbo machinery to manufacture the impeller which is machined with a 5-axis CNC machine to minimize tip clearance.
- A hard anodizing coating on the impeller and casing improves corrosion resistance and durability.

High Speed PMSM

- Self-developed Permanent Magnet Synchronous Motor (PMSM) has a high efficiency and power factor of more than 95%.
- Permits continuous operation with low current loss and offers excellent speed control.
- There is negligible mechanical loss during operation thanks to the rotor of motor and impeller being directly coupled.



High Efficiency VFD

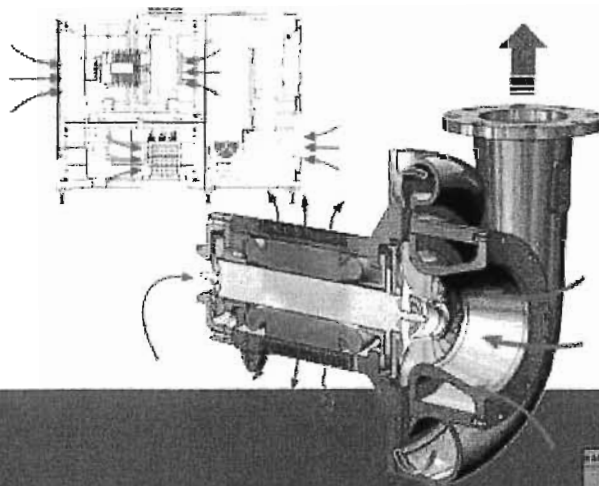
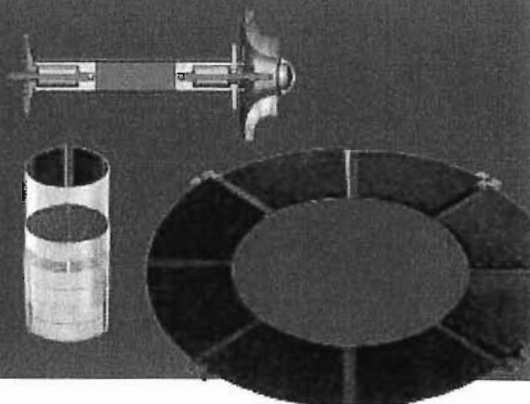
- The Variable Frequency Drive (VFD) conserves energy by controlling the rotational speed of the PMSM in order to adjust the discharge pressure and flow rate to meet customer needs.
- Inverter start of below 100% current at the time of initial start.
- Rapid load response.

EXCELLENT RELIABILITY

Proven air bearing and patented cooling system ensures continued trouble-free operation.

Aerospace Air Bearing Technology

- Non-contact air bearing that utilizes the dynamic pressure of air fluid. It is composed of two parts: a corrugated bump foil and high temperature alloy inner foil. As the rotor speeds up, a thin film of air creates a cushion between the shaft and the bearing surface.
- 100% Oil-Free Compressed Air – no lubricating oil or associated maintenance required.
- Reliable and proven technologies used in Aircraft Environmental Control Systems and Air Cycle Machines.
(Neuros air bearing used in a small-size turbo compressor installed in a fuel cell vehicle passed a 1,000,000 start/stop test.)
- Patent No. 10-064883 - Patent No. 10-1069542

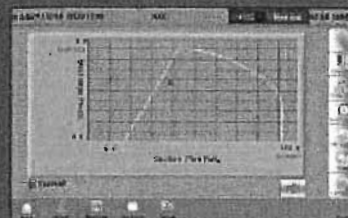


Patented Cooling System

- The blower motor VFD and other electrical components are cooled off using blower inlet air.
- No heat emission from the blower to the surroundings.
- Cooling System Patent No. 10-0572846

Surge Protection Logic

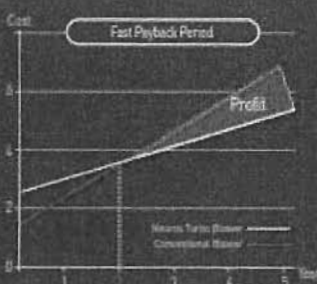
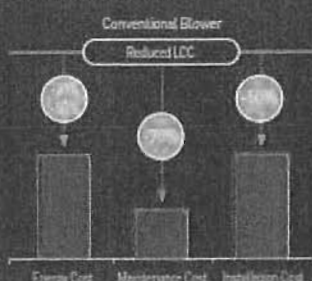
- Built-in Protection Logic in the blower to prevent surge during its operation by controlling its speed or blowing off air automatically.



ECONOMICAL LIFE CYCLE COST

Low LCC thanks to the blower's energy savings and low maintenance costs.

• Neuros Turbo Blower



Return on Investment

- NX and NC series can maximize the profitability of end users through significant reduction of LCC.
- Neuros Turbo Compressors save customers 50 to 70% of energy in applications that require a more flexible operation with air pressure of 120 - 250 kPa by replacing conventional compressors which produce 700 - 1,000 kPa.

Low Maintenance Cost

- Regular maintenance involves only clearing or replacing air filters.
- No expenditures on the replacement of oil, oil filters and water cooling systems.
- Reduced labor costs.



	New Filtration System		Remarks	Applying
	Pre Filter	Main Filter		
Filtration Efficiency	92% @ 100 µm	99% @ 2 µm	ASHRAE 52.2-1999	
Type	Coarse	Fine		
Material	Non-woven Fabrics	Synthetic Fibers		
Stage	2 Stages (Pre Filter + Main Filter)			
Maintenance	• Air Wash once a month • Replacement every 3 months	• Replacement every 2-3 months	• Warning & Fault Alarms • Depending on Circumstances	

Improved Filter System

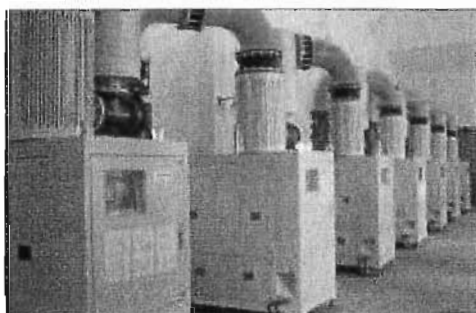
- NX and NC series use a Two-Stage filtration system to protect the mechanical and electrical components and increase their efficiency.
- An alarm will alert the operator when the differential pressure goes above a preset point indicating that the filter needs to be replaced.

CUSTOMER ORIENTED TECHNOLOGY

Easy to use control system and eco-friendly technology.

Control System to Meet Various Customer Demands

- Programmable Logic Controller is the central control point of the blower. It allows the end users to run the blower in automated mode at constant speed, pressure, flow or dissolved oxygen control mode.
- It is equipped with an easy to use touch screen which allows for easy control, monitoring and diagnostics to view all blower parameters and conditions.
- The blowers and compressors can be controlled and monitored remotely using a Master Control Panel through communication protocols such as Ethernet, Modbus, Profibus, and Hard Wiring.
- Various languages are available including English, Chinese, Japanese, Korean, Turkish and Russian.

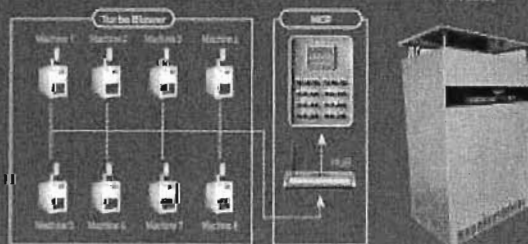


Eco-Friendly & User-Friendly Design

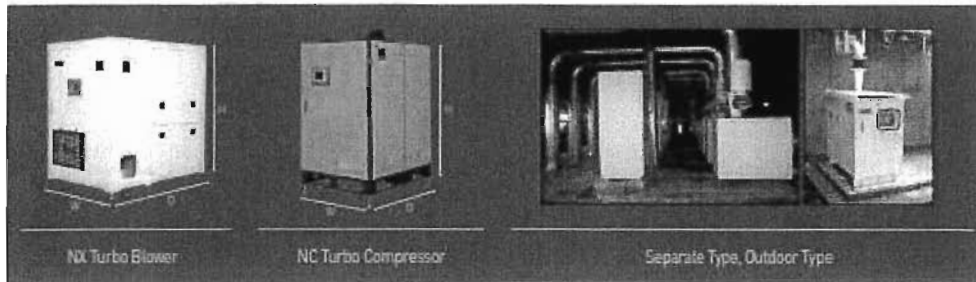
- Thanks to the patented non-contact air bearing and enclosure, the Blower has very low vibration of less than 1mm/s without the special foundations and noise levels below 65 dBA.
- Patent No. 10-0572953
- No environmental pollution thanks to the 100% Oil-Free System.
- CO₂ emission reduction thanks to the energy savings.
- Construction, electricity and plumbing costs are reduced thanks to the smaller footprint.
- Plug & Play operation with "all-in-one package".

Optional Items

- Master Control Panel (MCP) can be used to control up to 12 blowers giving the operator one point of control and monitoring, and each machine can be controlled through the remote communication with SCADA.
- Harmonic Filter can be installed inside or outside the enclosure of NX and NC series which provides an additional level of protection from harmonic distortion, removing harmonics generated during operation below the levels of THD_V 3%, THD_I 6%.



Product Specifications



Specifications

Model	Specifications			Dimensions and Weight(standard)			
	Cooling	Suction Flow (m ³ /min)	Motor Power (kW)	W (mm)	D (mm)	H (mm)	Weight (kg)
NX30	Air	9 - 23	22	770	1070	940	330
NX50	Air	19 - 45	37	770	1550	1350	580
NX75	Air	28 - 62	56	770	1550	1350	620
NX100	Air	42 - 98	74	770	1550	1350	700
NX150	Air	63 - 129	111	770	1750	1350	800
NX200	Air	85 - 167	149	1000	2300	1650	1190
NX200	Water	85 - 167	149	1000	2100	1650	1090
NX250	Air	98 - 169	179	1400	2100	1810	1500
NX250	Water	98 - 169	179	1400	2100	2020	1600
NX300	Air	131 - 257	223	1400	2100	1810	1500
NX300	Water	131 - 257	223	1400	2100	2020	1750
NX350	Air	144 - 266	246	1400	2100	1810	1590
NX350	Water	144 - 266	246	1400	2100	2020	1780
NX400	Air	170 - 334	298	1680	2240	1900	2140
NX400	Water	170 - 334	298	1680	2240	1900	2150
NX500	Air	196 - 337	358	1880	3080	2150	2980
NX500	Water	196 - 337	358	1880	3080	2150	2790
NX600	Air	262 - 514	447	1880	3080	2150	2950
NX600	Water	262 - 514	447	1880	3080	2150	3020
NX700	Air	288 - 532	492	1880	3080	2150	3130
NX700	Water	288 - 532	492	1880	3080	2150	3080
NC50	Air	12 - 14	37	1010	1300	1620	720
NC100	Water	26 - 33	74	970	1750	1560	980
NC300	Water	62 - 115	223	1400	2100	2020	1920
NC500	Water	164 - 230	447	1880	3080	2150	3330

• Discharge Pressure: NX series 0.5 - 1.0 kg/cm²; NC series 1.1 - 2.3 kg/cm² G

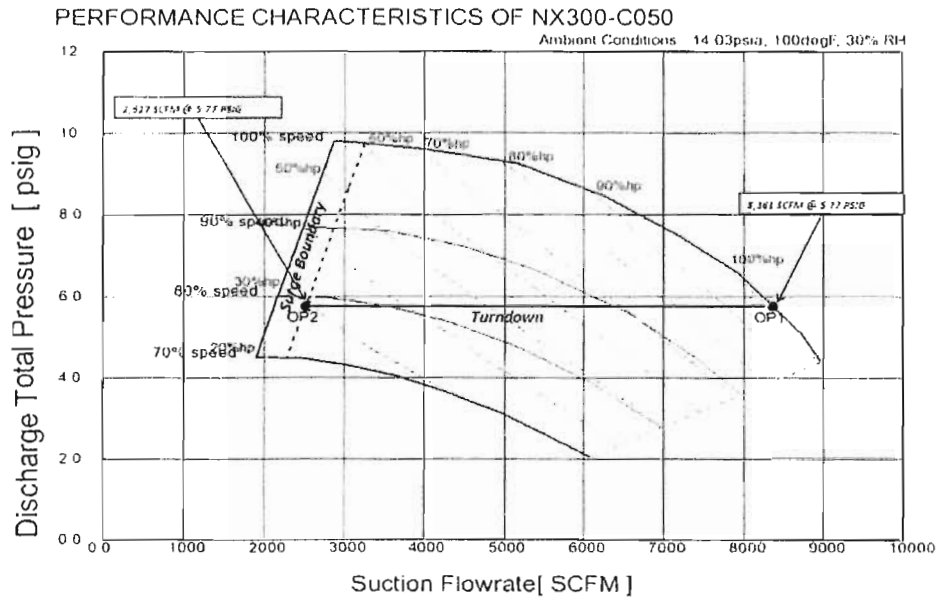
• Reference Conditions: 1.02 kg/cm², 4.20°C, 45% RH

• Tolerance: Air Flow: ±4%; Power: ±5%

• Complies with ISO9001, ASME PTC 10

• The specification of the product may be changed for improvement of performance without notice

Project Name - APG - Neuros Turbo Blower - Performance Curves



Project Name - APG - Neuros Turbo Blower - Performance Curves

