EXPRESSION OF INTEREST (EOI)

Project	CERES
Company / Client	Perdaman Chemicals and Fertilisers Pty Ltd
Material Requisition	0000-SA-E-50227
Number	
Package Title	Analyzers package, CEMS, Ambient Air Analyzer System and Sample
	Connections
1. SUBMISSION PROCI	DURE
EOI Instructions	Supplier(s) are invited to express interest by registering on ICN Gateway where competency and previous positive experiences of similar supply of goods / services can be demonstrated.
	When submitting interest registrants will be asked to complete an expression of interest document. The registrant's response will form their Expression of Interest (EOI) for material and/or services.
	Suppliers will only be considered for Prequalification should they satisfy stated criteria, including but not limited to Health, Safety & Environmental Management, Quality management, financial standing, relevant experience and availability.
EOI Closing Date	Please submit by close of business on 19/10/2023
Returnable Schedules	Where the EOI calls for any Returnable Schedules, please ensure all schedules are submitted.
Contact	All initial enquiries should be made through the Industry Capability Network Western Australia (ICNWA).
	Andie Pfaff andie.pfaff@icnwa.org.au +61 (08) 9365 7442
URL	For more information regarding the Perdaman, refer. • https://www.perdamanindustries.com.au/scjv/
2. INDICATIVE SCOPE	DF WORK
	Overview
Package Description	Saipem Australia Pty Ltd and Clough Projects Australia Pty Ltd Joint Venture (herein referred to as the "CONTRACTOR") has reached an agreement with Perdaman Chemicals and Fertilisers Pty Ltd (herein referred to as the "OWNER") for the Engineering, Procurement, Construction and Commissioning of the PROJECT CERES located in Burrup Strategic Industrial Area, Burrup Peninsula, Western Australia.
	Perdaman Chemicals and Fertilisers Pty Ltd (OWNER) is focused on the development of Perdaman - Project CERES which shall be the world's largest gas stream ammonia-urea plant with a production capacity of 2.14 MMTPA granular urea.

General Scope of Supply / Services

Design, engineering, supply of materials, fabrication and assembly, shop tests and inspections, painting and marking, packing, transportation, etc., of FOR ANALYZERS PACKAGE, CEMS, AMBIENT AIR ANALYZER SYSTEM AND SAMPLE CONNECTIONS as listed in Annexure 1.

Further inclusions consist of provision of management, design, calculation, procurement, fabrication, testing and certification to satisfy the scope of supply.

The following must be provided:

- Technical deviations list
- Special tools list
- Schedule of rates
- Spares list
- Quality assurance

Responsibilities will include inter alia:

- The VENDOR shall assure responsibility for the entire package, including each sub-supply and components indicated in this specification.
- Project management, reporting, attending meetings, participation in risk assessment workshops.
- Comply with site mobilisation and site requirements.
- Delivering work in a safe manner and to the required standards
- Whole Guarantee and responsibility for assembling and good operation of the complete unit.

Standards	Compliance with National, International and Industry Standards,
	Australian and WA Regulatory requirements.
Key Dates	Tender planned to be issued during end October 2023
Point of Delivery	Module Fabrication Yard in Chennai, India (Outside Australia)
3. RETURNABLE DOCU	MENTS
List of Returnable	List of experience on similar equipment supply projects
Schedules	

4. DISCLAIMER

This Expression of Interest to gain an insight into the capabilities of potential suppliers and/or service providers and not a Tender Invitation or offer - the schedule and content of this work is subject to change pending project demand and timelines.

FOR ANALYZERS PACKAGE, CEMS, AMBIENT AIR ANALYZER SYSTEM AND SAMPLE CONNECTIONS MTO List

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	hase	Probe	Sample trans	
										DAS	DAS	VVS					type	Length (m)
1	2610	Product block, Urea granulation, Urea melt Train 1	2610-AIT- 1018	Paramagnetic	Extractive type		O2 Analyzer	CO2 Compressor 2610-PK-101	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	-
2	3710	Utility block, Water treatment package, Desalinatio n	3710-AIT- 5001	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		Desalination and Demineralizatio n package 3710- PK-001 to saline water pond 3950-PD-006	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		Liquid	٧	Insulated tubing -Alloy 825 matl	30
3	1100	Syngas block, Reforming & Pretreatme	1100-AIT- 9201	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		LS steam drum (1100-V-220) to Intermittent blow drum (1100-V-703)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
4	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 9202	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	LS steam drum (1100-V-220) to Intermittent blow drum (1100-V-703)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		Liquid	٧	Insulated tubing -Alloy 825 matl	30
5	2500	Product block, Ammonia synthesis	2500-AIT- 3801	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		Loop steam drum (2500-V- 500) to Continuous blowdown drum (1100-V-702)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
6	2500	Product block, Ammonia synthesis	2500-AIT- 3803	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	Loop steam drum (2500-V- 500) to Continuous blowdown drum (1100-V-702)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
7	2500	Product block, Ammonia synthesis	2500-AIT- 4003	NDIR	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	NITIO	1st cold exchanger (2500-E-505) to Hot exchanger (2500-E-503)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
8	2500	Product block, Ammonia synthesis	2500-AIT- 4004	TCD/GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	H2 Analyzer	1st cold exchanger (2500-E-505) to Water cooler (2500-E-504)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
9	2500	Product block,	2500-AIT- 4005	TCD/NDIR/PGC/Plasma Emission detector/VTA	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced		1st cold exchanger (2500-E-505) to	Cabinet with Air	NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion		FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	Length
		Ammonia synthesis				line, Probe, pre-scs, Sample conditioning system, Vent master.		Hot exchanger (2500-E-503)	condition er								traced line, Alloy 825 matl	, , , , , , , , , , , , , , , , , , ,
10	2710	Product block, Urea granulation, Urea melt Train 2	2710-AIT- 1018	Paramagnetic	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	O2 Analyzer	CO2 Compressor 2710-PK-101	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
11	2610	Product block, Urea granulation, Urea synthesis Train 1	2610-AIT- 1005A	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	On Sample pot from carbamate condenser (2610-E-105-1)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H: T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
12	3730	Utility block, water treatment package, Demineraliz ation	3730-AIT- 0002	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Demineralizer water tank (3720-T-001) to Demin water pumps (3720-P- 001A/B & 3720- P-003 A/B)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H: T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
13	3730	Utility block, water treatment package, Demineraliz ation	3730-AIT- 6301	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	nH Analyzor	Demineralizer water tank (3720-T-001) to Demin water pumps (3720-P- 001A/B & 3720- P-003 A/B)	Rack	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H: T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
14	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0033	UV/Colorimetric	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	NH3	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+HZ T3	2 Liquid	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
15	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0034	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	nH Analyzor	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
16	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0035	Light scattering	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Turbidity	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H:	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30

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17	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0036	ORP	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	ORP	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	(m)
18	3310	Utility block, Steam condensate, BFW condensate	3310-AIT- 7701	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	nH Analyzer	BFW pump 3310-P-701B to KP BFW		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
19	3310	Utility block, Steam condensate, BFW condensate	3310-AIT- 7703	Aerometric	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	O2 Analyzer	BFW pump 3310-P-701B to KP BFW		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
20	1200	Syngas block, CO shift	1200-AIT- 1901	NDIR	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	CO Analyzer	MT shift converter 1200- R-206 to BFW preheater 1200- E-213-1/2	Rack mounted	NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
21	1100	Syngas block, Reforming & Pretreatme	1100- AZIT- 0101A	TCD-GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	Field		Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Ex- p]		٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
22	1100	Syngas block, Reforming & Pretreatme	1100- AZIT- 0101B	TCD-GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	Field	Natural gas filters (3990-A- 101A/B) to feed gas preheater coils (1100-E- 204-2)	1	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3	Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
23	1100	Syngas block, Reforming & Pretreatme	1100- AZIT- 0101C	TCD-GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	Field		Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
24	3950	Utility block, other utilities, Ponds	3950-AIT- 7024	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	1 '	1	NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		Liquid	٧	Insulated tubing -Alloy 825 matl	30
25	3910	Utility Block, Other utilities, Cooling water-once-	3910-AIT- 0031	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	i illouliteu	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		Liquid	V	Insulated tubing -Alloy 825 matl	30

S.	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion		FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone Ph	ase Probe	Sample trans	Length
		through Sea water															(m)
26	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0032	Amperometric	Chlorine with pH comp	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	chlorino	Sea water blowdown pump 3910-P- 002A/B to MUBRLL OSBL	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	quid V	Insulated tubing -Alloy 825 matl	30
27	1300	Syngas block, Syngas purification	1300-AIT- 3602	TCD/GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.		NWU Package (Driers & N2 Wash unit) 1300-PK-302 to synthesis gas compressor 2500-K-431	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		as V	Prefabricated Electrically heat traced line, Alloy 825 matl	30
28	1300	Syngas block, Syngas purification	1300-AIT- 3612	NDIR	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.		NWU Package (Driers & N2 Wash unit) 1300-PK-302 to synthesis gas compressor 2500-K-431	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		as V	Prefabricated Electrically heat traced line, Alloy 825 matl	30
29	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0001	UV/Colorimetric	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	Analyzor	Sea water exchanger 3910- E-001E/F/G to Seawater cooling tower 3910-PK-001	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3	quid V	Prefabricated Electrically heat traced line, Alloy 825 matl	30
30	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0002	Amperometric	Chlorine with pH comp	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	CI2 Analyzor	Sea water exchanger 3910- E-001E/F/G to Seawater cooling tower 3910-PK-001	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	quid V	Insulated tubing -Alloy 825 matl	30
31	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 1407	Faraday's Detector-Mass spectrometer	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	Ar, Ch4, CO2, CO, H2,	Waste heat boiler (1100-E- 208) to HT shift converter 1200- R-205	Aircondit ioned cabinet	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex d or Ex G p]	as V	Prefabricated Electrically heat traced line, Alloy 825 matl	30
32	1300	Syngas block, Syngas purification	1300-AIT- 3502	NDIR	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	CO2	Final gas separator 1300- V-311 to N2 wash unit 1300- PK-302	Rack mounted	NA	NA		(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		as V	Prefabricated Electrically heat traced line, Alloy 825 matl	30

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33	3920	Utility block, other utilities, Cooling Water- Closed loop	3920-AIT- 0021A	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	nH Analyzor	Cooling water pump 3920-P-001A/B/C to SW/CW Plate frame heat exchangers 3910-E-001G/H	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	٧	Insulated tubing -Alloy 825 matl	(m)
34	3920	Utility block, other utilities, Cooling Water- Closed loop	3920-AIT- 0021B	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	1	Cooling water pump 3920-P-001A/B/C to SW/CW Plate frame heat exchangers 3910-E-001G/H	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
35	2710	Product block, Urea granulation, Urea synthesis Train 2	2710-AIT- 1005A	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	On Sample pot from carbamate condenser (2710-E-105-1)	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
36	2610	Product block, Urea granulation, Urea synthesis Train 1	2610-AIT- 1005B	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	On Sample pot from 2nd condensate condenser 2610- E-105-2	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
37	2500	Product block, Ammonia synthesis	2500-AIT- 4803	NDIR	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	NH2	Off gas absorber 2500-C-501 to fuel header	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
38	3310	Utility block, Steam condensate, BFW condensate	3310-AIT- 7601	Catalytic Beed/Electro chemical	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	H2 Analyzer	Deaerator 3310- V-701 to safe location	I Kack	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
39	2710	Product block, Urea granulation, Urea synthesis Train 2	2710-AIT- 1005B	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	On Sample pot from 2nd condensate condenser 2710- E-105-2	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
40	2610	Product block, Urea granulation, Urea synthesis Train 1	2610-AIT- 1004	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	low pressure steam condensate from Steam condensate accumulator	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	٧	Insulated tubing -Alloy 825 matl	30

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								2610-V-110 to sample system										()
41	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AT- 0027	Amperometric	Chlorine with pH comp	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	chlorine	Sea water circulation pump 3910-P-001A/B to Sea water filters 3910-A-001A-H		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
42	1300	Syngas block, Syngas purification	1300-AIT- 2302	TCD/GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	H2 Analyzer	CO2 product separator 1300- V-303 to Urea plant		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
43	1200	Syngas block, CO shift	1200-AIT- 6103	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Stripped condensate cooler 1200-E- 612-1/2 to Off spec condensate tank 1200-T-601		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
44	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 1403	рН	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		Steam drum 1100-V-201 to continuous blowdown drum 1100-V-702	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		² Liquid	٧	Insulated tubing -Alloy 825 matl	30
45	2710	Product block, Urea granulation, Urea synthesis Train 2	2710-AIT- 1004	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	low pressure steam condensate from Steam condensate accumulator 2710-V-110 to sample system	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H T3[Ex ib]	2 Liquid	٧	Insulated tubing -Alloy 825 matl	30
46	2610	Product block, Urea granulation, Urea synthesis Train 1	2610-AIT- 1003	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	On sample pot from Stripper steam condensate separator 2610- V-109	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	V	Insulated tubing -Alloy 825 matl	30
47	3750	Utility block, Water treatment package, Process steam condensate polishing	3750-AIT- 5030	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Steam condensate tank 3750-T-102 to Process condensate & steam condensate polishing	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS		2 Liquid	V	Insulated tubing -Alloy 825 matl	30

S.	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	port line Length (m)
								package plant 3750-PK-001										(111)
48	3750	Utility block, Water treatment package, Process condensate polishing	3750-AIT- 5020	Contacting Conductivity	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		Steam condensate tank 3750-T-101 to Process condensate & steam condensate polishing package plant 3750-PK-001	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
49	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 9101	1) NOx: [Licensor proposal for Flue gas] Chemiluminescence [insitu or extractive] or IR [insitu or extractive] 2) So2: [Licensor proposal for Flue gas] NDIR [insitu] or UV pulse-fluorescent[extractive]	of measuring	CEMS Analyzer includes (minimum)-Alloy 825 material -100 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.		Flue gas fan 1100-K-203 stack	1	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			CEMS special probe	Prefabricated Electrically heat traced line, Alloy 825 matl	30
50	1100	Syngas block, Reforming & Pretreatme	1100-AIT- 9101B	ZrO2 Insitu [Licensor proposal for Flue gas]	Insitu	CEMS	CEMS: Oxygen	Flue gas fan 1100-K-203 stack	Insitu with purge panel	NA	MODBUS TCP/IP	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	Zirconia probe		
51	1100	Syngas block, Reforming & Pretreatme	1100-AIT- 9101C	NDIR [Licensor proposal for Flue gas]	Extractive type	CEMS	CEMS: Carbon Monoxide	Flue gas fan 1100-K-203 stack	RACK or Cabinet with AC	1	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			CEMS special probe	Prefabricated Electrically heat traced line, Alloy 825 matl	30
52	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 9101E	Laser scattering light for dust [PM10]	Insitu	CEMS	CEMS: Dust	Flue gas fan 1100-K-203 stack	Insitu with purge panel	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			Optical		
53	1300	Syngas block, Syngas purification	1300-AIT- 3614	Paramagnetic	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	O2 Analyzer	High pressure gaseous nitrogen to NWU Package (Driers & N2 Wash unit) 1300-PK-302		NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
54	2710	Product block, Urea granulation,	2710-AIT- 1003	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample		On sample pot from Stripper steam	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion		FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	Length
		Urea synthesis Train 2				cooler (inside SS316 box), mounting rack with canopy		condensate separator 2710- V-109										(m)
55	2610	Product block, Urea granulation, Urea melt Train 1	2630-AIT- 1103	RAMAN/GC	Extractive type	Single analyzer with two streams if RAMAN OR Two separate GC dedicated for each stream	H2, C4, O2, NH3, N2 and CO2[Raman]	M.P Ammonia absorber 2610- E-111 to primary	Aircondit	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Ex- p]	Gas	PYROLY SIS / REFLUX PROBE	Prefabricated Electrically heat traced line, Alloy 825 matl	Stream- 1=180 Stream2= 200
56	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0026A	рН	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	n∐ Analyzor	Sea water circulation pump 3910-P-001A/B to Sea water filters 3910-A-001A-H	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
57	3910	Utility Block, Other utilities, Cooling water-once- through Sea water	3910-AIT- 0026B	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Sea water circulation pump 3910-P-001A/B to Sea water filters 3910-A-001A-H	mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
58	2610	Product block, Urea granulation, Urea synthesis Train 1	2610-AIT- 1006	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	1	Final Process condensate cooler 2610-E- 112 outlet	Rack	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
59	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 1401	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Steam drum 1100-V-201 to continuous blowdown drum 1100-V-702		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
60	2710	Product block, Urea granulation, Urea synthesis Train 2	2710-AIT- 1006	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Final Process condensate cooler 2710-E- 112 outlet	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
61	2610	Product block, Urea granulation, Urea melt Train 1	2610-AIT- 1019	TCD/PGC/IR Equivalent	Extractive type		CH3OH [methanol], H2	CO2 Purifier 2610-V-130 to CO2 compressor 2610-PK-101	Rack	NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
62	3920	Utility block, other utilities,	3920-AIT- 6007	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample		Cooling water return to cooling water expansion	I Kack	NA	NA	NA	(1) Al Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	Length
		Cooling Water- Closed loop				cooler (inside SS316 box), mounting rack with canopy		vessel 3920-V- 001										(m)
63	3760	Utility block, Waste treatment package, WWTP	3760-AIT- 0001	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Final observation Basin mixer (3760-X-001) to MURBL via cooling tower blowdown line	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
64	1100	Syngas block, Reforming & Pretreatme nt	1100-AIT- 0103	TCD-GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	C1-C4, NZ,	Natural gas filters (3990-A- 101A/B) to feed gas preheater coils (1100-E- 204-2)		NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Ex- p]	Gas	٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
65	1300	Syngas block, Syngas purification	1300-AIT- 2901	Contacting Conductivity	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	Conductivity	Polished water to DMW preheater No.1 1300-E-304	1	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
66	2620	Product block, Urea Granulation , Urea Granulation Train 1	2620-AT- 2506	Laser insitu or NDIR	insitu or Extractive type	CEMS	Ammonia Analyzer	Urea Granulation Train 1 Vent Stack	Rack mounted	NA	MODBUS TCP/IP	NA	(1) Al Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	TDLAS	Prefabricated Electrically heat traced line, Alloy 825 matl	1.50
67	2620	Product block, Urea Granulation , Urea Granulation Train 1	2620-AT- 2504	Scattering light	Insitu [urea becomes like paste at reduced temp		Urea dust Analyzer	Urea Granulation Train 1 Vent Stack	Insitu with purge panel	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	Optical	NA	NA
68	2620	Product block, Urea Granulation	2620-AIT- 2071	Vibrating fork/Coriolis	1 ''	CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Granulator Dust scrubber 2620- C-201-1 to Urea 2620-T-203		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	na	na	na
69	2620	Product block, Urea Granulation , Urea Granulation Train 1	2620-AIT- 2732	рН	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	nH Analyzer	Collection tank for 2620-C-201- 2 (2620-T-205) recirculation line	with purge	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	٧	Insulated tubing -Alloy 825 matl	30
70	2620	Product block, Urea Granulation , Urea		Vibrating fork/Coriolis		CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Collection tank for 2620-C-201- 2 (2620-T-205) recirculation line	inline or	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Liquid	na	na	na

S. no	Unit no.	Area Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	Length
		Granulation Train 1															
71	2720	Product block, Urea Granulation 2720-AT- , Urea 2506 Granulation Train 2	Laser insitu or NDIR	insitu or Extractive type	CEMS	Ammonia Analyzer	Urea Granulation Train 2 Vent Stack	Insitu with purge panel	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			TDLAS	Prefabricated Electrically heat traced line, Alloy 825 matl	30
72	2720	Product block, Urea Granulation 2720-AT- , Urea 2504 Granulation Train 2	Scattering light	Insitu [urea becomes like paste at reduced temp]	CEMS	Urea dust Analyzer		Insitu with purge panel	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Gas	Optical	NA	NA
73	2720	Product block, Urea Granulation , Urea Granulation Train 2	Vibrating fork/Coriolis		CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Granulator Dust scrubber 2720- C-201-1 to Urea 2720-T-203		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS		Liquid	na	na	na
74	2720	Product block, Urea Granulation 2720-AIT- , Urea 2732 Granulation Train 2	рН	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy		Collection tank for 2720-C-201- 2 (2720-T-205) recirculation line	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	V	Insulated tubing -Alloy 825 matl	30
75	2720	Product block, Urea Granulation , Urea Granulation Train 2	Vibrating fork/Coriolis		CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Collection tank for 2720-C-201- 2 (2720-T-205) recirculation line		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex ib]	Liquid	na	na	na
76	2710	Product block, Urea granulation, Urea melt Train 2	TCD/PGC/IR Equivalent	Extractive type		CH3OH [methanol], H2	CO2 Purifier 2710-V-130 to CO2 compressor 2710-PK-101		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS			٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
77	3990	Utility block, other utilities, Natural gas and Fuel gas system and distribution	TCD-GC	Extractive type	Analyzer includes (minimum)-Alloy 825 material -30 meters prefabricated heat traced line, Probe, pre-scs, Sample conditioning system, Vent master, mounting rack with canopy.	(Compositio	From NG filter 3990-A-101B to Ammonia/refor ming unit feed and Fuel gas electric preheaters	Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) Al- Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	72[Ev d or Ev		٧	Prefabricated Electrically heat traced line, Alloy 825 matl	30
78	3920	Utility block, 3920-AIT- other 6008, 2" utilities, flange	Catalytic Beed/ Electro chemical	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample	H2 Analyzer	At cooling water expansion vessel (3920-V-001)		NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS			٧	Prefabricated Electrically heat	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	Length
		Cooling Water- Closed loop	connectio n			cooler (inside SS316 box), mounting rack with canopy											traced line, Alloy 825 matl	(,
79	1100	Syngas block, Reforming & Pretreatme nt	1100-FIT- 9101	Ultrasonic Flow meter	Cross duct type flow meter	CEMS	Flow input to CEMS system for mass-based measureme nt	Flue gas fan 1100-K-203 stack	inline cross duct	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Flow meter fault] Hardwired to DCS			see next sheet [CEMS- Ammoni a Plant]	NA	TBD
80	1100- SC-6202		1100-SC- 6202	sample connection	Type-3	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
81	1300- SC-2301		1300-SC- 2301	sample connection	Type-3	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
82	1100- SC-0102		1100-SC- 0102	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
83	1100- SC-6201		1100-SC- 6201	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
84	1300- SC-3413		1300-SC- 3413	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
85	1300- SC-3501		1300-SC- 3501	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
86	1300- SC-3601		1300-SC- 3601	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
87	2500- SC-4801		2500-SC- 4801	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box		-	-	-	-	-	-	-	-	-	-	-
88	2500- SC-4201		2500-SC- 4201	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
89	2500- SC-4302		2500-SC- 4302	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
90	2500- SC-4701		2500-SC- 4701	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
91	2500- SC-4501		2500-SC- 4501	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
92	2500- SC-4301		2500-SC- 4301	sample connection	Type-4	<u>-</u>	sampling	-	-	-	-	-	-	-	-	-	-	-
93	2500- SC-4401		2500-SC- 4401	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
94	2610- SC-1001		2610-SC- 1001	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
95	2610- SC-1002		2610-SC- 1002	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
96	2610- SC-1003		2610-SC- 1003	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
97	2610- SC-1004		2610-SC- 1004	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
98	2610- SC-1013		2610-SC- 1013	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-

S.	Unit no.	Area Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample trans	sport line Length (m)
99	2610- SC-1014	2610-SC- 1014	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
100	2610- SC-1016	2610-SC- 1016	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box		-	-	-	-	-	-	-	-	-	-	-
101	2610- SC-1019	2610-SC- 1019	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
102	2610- SC-1020	2610-SC- 1020	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
103	2610- SC-1030	2610-SC- 1030	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
104	2710- SC-1001	2710-SC- 1001	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
105	2710- SC-1002 2710-	2710-SC- 1002 2710-SC-	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling	-	-	-	-	-	-	-	-	-	-	-
106	SC-1003 2710-	2710-SC- 1003 2710-SC-	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling	-	-	-	-	-	-	-	-	-	-	-
107	SC-1004 2710-	1004 2710-SC-	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling	-	-	-	-	-	-	-	-	-	-	-
108	SC-1013 2710-	1013 2710-SC-	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling manual	-	-	-	-	-	-	-	-	-	-	-
110	SC-1014 2710-	1014 2710-SC-	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,		-	- -		_	_	_	-	- _	_	_	1-
111	SC-1016 2710-	1016 2710-SC-	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	1	-	-	_	-	-	-	-	-	-	-	-
112	SC-1019 2710- SC- 1020	1019 2710-SC- 1020	sample connection	Type-4	interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling manual sampling	-	-	-	-	-	-	-	-	-	-	-
113	2710- SC-1030	2710-SC- 1030	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box		-	-	-	-	-	-	-	-	-	-	-
114	3990- SC-0001	3990-SC- 0001	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box		-	-	-	-	-	-	-	-	-	-	-
115	3990- SC-0003	3990-SC- 0003	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
116	3990- SC-0002	3990-SC- 0002	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
117	4210- SC- 00001	4210-SC- 00001	sample connection	Type-4	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
118	1100- SC-0601	1100-SC- 0601	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
119	1100- SC-0602	1100-SC- 0602	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
120	1100- SC-0603	1100-SC- 0603	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
121	1100- SC-0604	1100-SC- 0604	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-

S.	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion	FO link to AAAS- DAS	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample tran	Length
122	1100-		1100-SC-	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing,	manual											(m)
122	SC-0605		0605	Sample connection	туре-5	interface flanges. Installed inside a SS316 box	sampling	-	ļ-	-	-	-	-	-	-	-	-	
123	1100- SC-1404		1100-SC- 1404	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	manual sampling	-	-	-	-	-	-	-	-	-	-	-
	1200-		1200-SC-			500CC Sample bomb, QC, flexi hoses, tubing,	_ · · ·						1					
124	SC-1601		1601	sample connection	Type-5	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
125	1200-		1200-SC-	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing,	1	_	_	-	_	_	_	_	_	_	_	_
	SC-1801		1801		.,,,,,	interface flanges. Installed inside a SS316 box	sampling											
126	1100- SC-6203		1100-SC- 6203	sample connection	Type-6	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
127	1200-		1200-SC-		T C	500CC Sample bomb, QC, flexi hoses, tubing,	 											
127	SC-6101		6101	sample connection	Type-6	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	
128	1200-		1200-SC-	sample connection	Type-6	500CC Sample bomb, QC, flexi hoses, tubing,	1	-	-	-	-	_	-	-	-	_	_	-
	SC-2501 1100-		2501 1100-SC-			interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling											
129	SC-0201		0201	sample connection	Type-14	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
130	1100-		1100-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,	_ · · ·					_		_	_		_	1_
130	SC-0202		0202	sample connection	Туре-14	interface flanges. Installed inside a SS316 box	sampling	-		-		-	-		-			
131	1100- SC-0203		1100-SC- 0203	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	1	-	-	-	-	-	-	-	-	-	-	-
	1100-		1100-SC-			500CC Sample bomb, QC, flexi hoses, tubing,	sampling											
132	SC-0205		0205	sample connection	Type-14	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
133	1100-		1100-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,	manual	_	_	-	_	_	_	_	_	_	_	1_
	SC-0206		0206	Sumple confidence	1,465.14	interface flanges. Installed inside a SS316 box	sampling											
134	2500- SC-4002		2500-SC- 4002	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
	2500-		2500-SC-			500CC Sample bomb, QC, flexi hoses, tubing,												+
135	SC-4008		4008	sample connection	Type-14	interface flanges. Installed inside a SS316 box	sampling	-	-	•	-	-	-	-	-	-	-	-
136	2500-		2500-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,		_	_	_	_	_	_	_	_	_	_	_
	SC-4006 2500-		4006 2500-SC-	, , , , , , , , , , , , , , , , , , ,	77-	interface flanges. Installed inside a SS316 box	sampling											
137	SC-4007		4007	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing, interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
120	2500-		2500-SC-	sample connection	Tuno 14	500CC Sample bomb, QC, flexi hoses, tubing,												
138	SC-3805		3805	sample connection	Type-14	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	
139	1300-		1300-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,		-	-	-	-	_	-	-	-	-	-	-
	SC-3414 1300-		3414 1300-SC-			interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling											+
140	SC-3403		3403	sample connection	Type-14	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
141	1300-		1300-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,		_	_	_	_	_			_	_	_	1_
141	SC-3405		3405	Sample connection	1 ype-14	interface flanges. Installed inside a SS316 box	sampling	-	-	-	_	_	-	-		_	-	
142	1300- SC-3407		1300-SC-	sample connection	Type-14	500CC Sample bomb, QC, flexi hoses, tubing,	1	-	-	-	-	-	-	-	-	-	-	-
	2620-		3407 2620-SC-			interface flanges. Installed inside a SS316 box 500CC Sample bomb, QC, flexi hoses, tubing,	sampling											
143	SC-2507		2507	sample connection	Type-5	interface flanges. Installed inside a SS316 box	sampling	-	-	-	-	-	-	-	-	-	-	-
144	2720-		2720-SC-	sample connection	Type-5	500CC Sample bomb, QC, flexi hoses, tubing,	manual	_	_	_	_	_	_	_	_	_	_	_
_ 	SC-2507		2507	Sample connection	1,900.5	interface flanges. Installed inside a SS316 box	sampling											

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa tion		FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line type Length (m)	
145	4100		4100- AAAS-001	Chemiluminescence type-NOX Nondispersive Infrared-CO UV Fluorescence-SO2 Chemiluminescence type-NH3 Photo Ionization Detector (PID)-BTX UV Photometric/Chemiluminesce nce type-O3 β-ray attenuation-PM10 and PM2.5			NOX, CO, SO2, NH3, BTX, O3, PM10, PM2.5		AIR- CONDITI ONED ANALYZE R HOUSE [6mx3mx 3m] WITH DATA LOGGER AND ANALYZE RS	MODBUS TCP IP								
146	4120		4120- AAAS-002	Chemiluminescence type-NOX Nondispersive Infrared-CO UV Fluorescence-SO2 Chemiluminescence type-NH3 Photo Ionization Detector (PID)-BTX UV Photometric/Chemiluminesce nce type-O3 β-ray attenuation-PM10 and PM2.5			NOX, CO, SO2, NH3, BTX, O3, PM10, PM2.5		AIR- CONDITI ONED ANALYZE R HOUSE [6mx3mx 3m] WITH DATA LOGGER AND ANALYZE RS	MODBUS TCP IP								
147	3700		3700- AAAS-003	Chemiluminescence type-NOX Nondispersive Infrared-CO UV Fluorescence-SO2 Chemiluminescence type-NH3 Photo Ionization Detector (PID)-BTX UV Photometric/Chemiluminesce nce type-O3 β-ray attenuation-PM10 and PM2.5			NOX, CO, SO2, NH3, BTX, O3, PM10, PM2.5		AIR- CONDITI ONED ANALYZE R HOUSE	MODBUS TCP IP								
148	4400		4400- AAAS-004	Chemiluminescence type-NOX Nondispersive Infrared-CO UV Fluorescence-SO2 Chemiluminescence type-NH3 Photo Ionization Detector (PID)-BTX UV Photometric/Chemiluminesce nce type-O3			NOX, CO, SO2, NH3, BTX, O3, PM10, PM2.5		AIR- CONDITI ONED ANALYZE	MODBUS TCP IP								

S.	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Туре	Service	Installa	to AAAS-	FO link to CEMS- DAS	FO link to Analyzer WS	MODBUS/Hardwired to	Zone	Phase	Probe	Sample tra	Length
				β-ray attenuation-PM10 and PM2.5					AND ANALYZE RS								турс	(m)
149	447A01		447A01- ANSSR- 001 447A01-	Workstation system for GC, Raman and Mass spectrometer														
150			AAASSR- 001 447A01- CEMSSR- 001 447A01-	Central report data management for AAAS CEMS Server / DAS Remote monitoring display for														
152 153			ANSEWS- 001 447A01- AAASEWS -001															
154	447A01		447A01- CEMSEWS -001	Workstation for CEMS														

Legend

CEMS Continuous Emission Monitoring system

AAAS Ambient Air Analyzer system
BTX Benzene, Toluene and Xylene