

## EXPRESSION OF INTEREST (EOI)

<b>Project</b>	CERES
<b>Company / Client</b>	Perdaman Chemicals and Fertilisers Pty Ltd
<b>Material Requisition Number</b>	0000-SA-E-50227
<b>Package Title</b>	<b>Analyzers package, CEMS, Ambient Air Analyzer System and Sample Connections</b>
<b>1. SUBMISSION PROCEDURE</b>	
<b>EOI Instructions</b>	<p>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.</p> <p>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.</p> <p>Suppliers will only be considered for Prequalification should they satisfy stated criteria, including but not limited to Health, Safety &amp; Environmental Management, Quality management, financial standing, relevant experience and availability.</p>
<b>EOI Closing Date</b>	Please submit by close of business on <b>19/10/2023</b>
<b>Returnable Schedules</b>	Where the EOI calls for any Returnable Schedules, please ensure all schedules are submitted.
<b>Contact</b>	<p>All initial enquiries should be made through the Industry Capability Network Western Australia (ICNWA).</p> <p>Andie Pfaff  <a href="mailto:andie.pfaff@icnwa.org.au">andie.pfaff@icnwa.org.au</a>  +61 (08) 9365 7442</p>
<b>URL</b>	<p>For more information regarding the Perdaman, refer.</p> <ul style="list-style-type: none"> <li>• <a href="https://www.perdamanindustries.com.au/scjv/">https://www.perdamanindustries.com.au/scjv/</a></li> </ul>
<b>2. INDICATIVE SCOPE OF WORK</b>	
<b>Package Description</b>	<p><b>Overview</b></p> <p>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.</p> <p>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.</p>

	<p><b>General Scope of Supply / Services</b></p> <p>Design, engineering, supply of materials, fabrication and assembly, shop tests and inspections, painting and marking, packing, transportation, etc., of <b>FOR ANALYZERS PACKAGE, CEMS, AMBIENT AIR ANALYZER SYSTEM AND SAMPLE CONNECTIONS</b> as listed in Annexure 1.</p> <p>Further inclusions consist of provision of management, design, calculation, procurement, fabrication, testing and certification to satisfy the scope of supply.</p> <p>The following must be provided:</p> <ul style="list-style-type: none"> <li>• Technical deviations list</li> <li>• Special tools list</li> <li>• Schedule of rates</li> <li>• Spares list</li> <li>• Quality assurance</li> </ul> <p>Responsibilities will include <i>inter alia</i>:</p> <ul style="list-style-type: none"> <li>• The VENDOR shall assure responsibility for the entire package, including each sub-supply and components indicated in this specification.</li> <li>• Project management, reporting, attending meetings, participation in risk assessment workshops.</li> <li>• Comply with site mobilisation and site requirements.</li> <li>• Delivering work in a safe manner and to the required standards</li> <li>• Whole Guarantee and responsibility for assembling and good operation of the complete unit.</li> </ul>
<b>Standards</b>	Compliance with National, International and Industry Standards, Australian and WA Regulatory requirements.
<b>Key Dates</b>	Tender planned to be issued during end October 2023
<b>Point of Delivery</b>	Module Fabrication Yard in Chennai, India (Outside Australia)
<b>3. RETURNABLE DOCUMENTS</b>	
<b>List of Returnable Schedules</b>	List of experience on similar equipment supply projects
<b>4. DISCLAIMER</b>	
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	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	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	Zone 2 IIB+H2 T3[Exd or Exp]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
2	3710	Utility block, Water treatment package, Desalination	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	Conductivity Analyzer	Desalination and Demineralization 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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30
3	1100	Syngas block, Reforming & Pretreatment	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	Conductivity 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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30
4	1100	Syngas block, Reforming & Pretreatment	1100-AIT-9202	pH	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	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	Conductivity 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	v	Insulated tubing -Alloy 825 matl	30
6	2500	Product block, Ammonia synthesis	2500-AIT-3803	pH	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	v	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.	NH3 Analyzer	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	Zone 2 IIB+H2 T3[Exd or Exp]	Gas	v	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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	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	Ar and H2 analyzer	1st cold exchanger (2500-E-505) to	Cabinet with Air	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	Prefabricated Electrically heat	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line		
																	type	Length (m)	
		Ammonia synthesis				line, Probe, pre-scs, Sample conditioning system, Vent master.		Hot exchanger (2500-E-503)	conditioner									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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	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 Analyzer	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+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30	
12	3730	Utility block, water treatment package, Demineralization	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 Analyzer	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+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30	
13	3730	Utility block, water treatment package, Demineralization	3730-AIT-6301	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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+H2 T3[Ex ib]	Liquid	v	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 Analyzer	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	Liquid	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30	
15	3910	Utility Block, Other utilities, Cooling water-once-through Sea water	3910-AIT-0034	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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	v	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 Analyzer	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+H2 T3	Liquid	v	Insulated tubing -Alloy 825 matl	30	

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
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 Analyzer	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	v	Insulated tubing -Alloy 825 matl	30
18	3310	Utility block, Steam condensate, BFW condensate	3310-AIT-7701	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	BFW pump 3310-P-701B to KP BFW	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
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	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	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) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
21	1100	Syngas block, Reforming & Pretreatment	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 mounted GC		Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS]	Zone 2 IIB+H2 T3[Ex-d or Exp]		v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
22	1100	Syngas block, Reforming & Pretreatment	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 mounted GC	Natural gas filters (3990-A-101A/B) to feed gas preheater coils (1100-E-204-2)	Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS]	Zone 2 IIB+H2 T3	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
23	1100	Syngas block, Reforming & Pretreatment	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 mounted GC		Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS]	Zone 2 IIB+H2 T3		v	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 Analyzer	Saline water pond 3950-P-006A/B to MURBL	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
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 Analyzer	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	v	Insulated tubing -Alloy 825 matl	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
		through Sea water																
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	Free chlorine analyzer	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	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.	H2 Analyzer	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	Zone 2 IIB+H2 T3[Ex d or Ex p]	Gas	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.	CO	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	Zone 2 IIB+H2 T3[Ex d or Ex p]	Gas	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.	NH3 Analyzer	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	Liquid	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	Cl2 Analyzer	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]	Liquid	v	Insulated tubing -Alloy 825 matl	30
31	1100	Syngas block, Reforming & Pretreatment	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, N2	Waste heat boiler (1100-E-208) to HT shift converter 1200-R-205	Airconditioned cabinet	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex d or Ex p]	Gas	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex d or Ex p]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
33	3920	Utility block, other utilities, Cooling Water-Closed loop	3920-AIT-0021A	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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]	Liquid	v	Insulated tubing -Alloy 825 matl	30
34	3920	Utility block, other utilities, Cooling Water-Closed loop	3920-AIT-0021B	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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]	Liquid	v	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	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.	NH3 Analyzer	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	Zone 2 IIB+H2 T3[Ex d'or Ex p]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
38	3310	Utility block, Steam condensate, BFW condensate	3310-AIT-7601	Catalytic chemical	Beed/Electro 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	Deerator 3310-V-701 to safe location	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Low flow alarm] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex d or Ex p]	Gas	v	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 Analyzer	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]	Liquid	v	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
								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	Free chlorine analyzer	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	v	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	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex d'or Ex p]	Gas	v	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 Analyzer	Stripped condensate cooler 1200-E-612-1/2 to Off spec condensate tank 1200-T-601	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
44	1100	Syngas block, Reforming & Pretreatment	1100-AIT-1403	pH	Extractive	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	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 Analyzer	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+H2 T3[Ex ib]	Liquid	v	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	Insulated tubing -Alloy 825 matl	30



S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line		
																	type	Length (m)	
								package plant 3750-PK-001											
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	Conductivity Analyzer	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	v	Insulated tubing -Alloy 825 matl	30	
49	1100	Syngas block, Reforming & Pretreatment	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]	see column of measuring principle	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.	CEMS: NOx, Sox	Flue gas fan 1100-K-203 stack	RACK or Cabinet with AC	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	CEMS special probe	Prefabricated Electrically heat traced line, Alloy 825 matl	30	
50	1100	Syngas block, Reforming & Pretreatment	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) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	Zirconia probe			
51	1100	Syngas block, Reforming & Pretreatment	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	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	CEMS special probe	Prefabricated Electrically heat traced line, Alloy 825 matl	30	
52	1100	Syngas block, Reforming & Pretreatment	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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	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	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	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	Conductivity Analyzer	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	v	Insulated tubing -Alloy 825 matl	30	

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
		Urea synthesis Train 2				cooler (inside SS316 box), mounting rack with canopy		condensate separator 2710-V-109										
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 flare package 2610-PK-112 (MP inert vents)	Airconditioned cabinet	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	PYROLYSIS / REFLUX PROBE	Prefabricated Electrically heated line, Alloy 825 matl	Stream-1=180 Stream2=200
56	3910	Utility Block, Other utilities, Cooling water-once-through Sea water	3910-AIT-0026A	pH	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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	v	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 Analyzer	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	v	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	Conductivity Analyzer	Final Process condensate cooler 2610-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	v	Insulated tubing -Alloy 825 matl	30
59	1100	Syngas block, Reforming & Pretreatment	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 Analyzer	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	Zone 2 IIB+H2 T3[Ex ib]	Liquid	v	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 Analyzer	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	v	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 mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	Prefabricated Electrically heated 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	Conductivity Analyzer	Cooling water return to cooling water expansion	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

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
		Cooling Water-Closed loop				cooler (inside SS316 box), mounting rack with canopy		vessel 3920-V-001										
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 Analyzer	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	v	Insulated tubing -Alloy 825 matl	30
64	1100	Syngas block, Reforming & Pretreatment	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, N2, CO2 GC	Natural gas filters (3990-A-101A/B) to feed gas preheater coils (1100-E-204-2)	Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	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 Analyzer	Polished water to DMW preheater No.1 1300-E-304	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
66	2620	Product block, Urea Granulation, Urea Granulation Train 1	2620-AT-2506	Laser insitu or NDIR	insitu or Extractive type		Ammonia Analyzer	Urea Granulation Train 1 Vent Stack	Rack mounted	NA	MODBUS TCP/IP	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	TDLAS	Prefabricated Electrically heat traced line, Alloy 825 matl	30
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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	Optical	NA	NA
68	2620	Product block, Urea Granulation, Urea Granulation Train 1	2620-AIT-2071	Vibrating fork/Coriolis	insitu with bypass for tuning [or] inline		Density Analyzer	Granulator Dust scrubber 2620-C-201-1 to Urea 2620-T-203	inline or insitu	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	pH	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	Collection tank for 2620-C-201-2 (2620-T-205) recirculation line	Insitu with purge panel	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
70	2620	Product block, Urea Granulation, Urea	2620-AIT-2731	Vibrating fork/Coriolis	insitu with bypass for tuning [or] inline		Density Analyzer	Collection tank for 2620-C-201-2 (2620-T-205) recirculation line	inline or insitu	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

S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
		Granulation Train 1																
71	2720	Product block, Urea Granulation, Urea Granulation Train 2	2720-AT-2506	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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	TDLAS	Prefabricated Electrically heat traced line, Alloy 825 matl	30
72	2720	Product block, Urea Granulation, Urea Granulation Train 2	2720-AT-2504	Scattering light	Insitu [urea becomes like paste at reduced temp]	CEMS	Urea dust 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	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	Optical	NA	NA
73	2720	Product block, Urea Granulation, Urea Granulation Train 2	2720-AIT-2071	Vibrating fork/Coriolis	insitu with bypass for tuning [or] inline	CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Granulator Dust scrubber 2720-C-201-1 to Urea 2720-T-203	inline or insitu	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
74	2720	Product block, Urea Granulation, Urea Granulation Train 2	2720-AIT-2732	pH	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample cooler (inside SS316 box), mounting rack with canopy	pH Analyzer	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	2720-AIT-2731	Vibrating fork/Coriolis	insitu with bypass for tuning [or] inline	CORIOLIS has advantage in liquid and Single gas density measurement.	Density Analyzer	Collection tank for 2720-C-201-2 (2720-T-205) recirculation line	inline or insitu	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	2710-AIT-1019	TCD/PGC/IR Equivalent	Extractive type		CH3OH [methanol], H2	CO2 Purifier 2710-V-130 to CO2 compressor 2710-PK-101	Rack mounted	NA	NA	NA	(1) AI Hardwired to DCS, (2) DI [Analyzer fault] Hardwired to DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
77	3990	Utility block, other utilities, Natural gas and Fuel gas system and distribution	3990-AIT-0001	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.	GC (Composition & density of NG) GC	From NG filter 3990-A-101B to Ammonia/reforming unit feed and Fuel gas electric preheaters	Rack mounted	NA	NA	MODBUS TCP/IP	(1) MODBUS TCP/IP, (2) AI-Hardwired for each component, (3) DI [Indicating Analyzer Fault in DCS	Zone 2 IIB+H2 T3[Ex-d or Exp]	Gas	v	Prefabricated Electrically heat traced line, Alloy 825 matl	30
78	3920	Utility block, other utilities,	3920-AIT-6008, 2" flange	Catalytic Beed/ Electro	Extractive type	Analyzer includes (minimum)- Probe, Sample conditioning system with fast loop and sample	H2 Analyzer	At cooling water expansion vessel (3920-V-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-d or Exp]	Gas	v	Prefabricated Electrically heat	30











S. no	Unit no.	Area	Tag no	Measuring principle	Extract Or insitu	Accessory	Type	Service	Installation	FO link to AAAS-DAS	FO link to CEMS-DAS	FO link to Analyzer WS	MODBUS/Hardwired to PCS	Zone	Phase	Probe	Sample transport line	
																	type	Length (m)
				β-ray attenuation-PM10 and PM2.5					AND ANALYZERS									
149	447A01		447A01-ANSSR-001	Workstation system for GC, Raman and Mass spectrometer														
150	447A01		447A01-AAASSR-001	Central report data management for AAAS														
151	447A01		447A01-CEMSSR-001	CEMS Server / DAS														
152	447A01		447A01-ANSEWS-001	Remote monitoring display for GC, Raman and Mass spectrometer														
153	447A01		447A01-AAASEWS-001	Workstation for AAAS														
154	447A01		447A01-CEMSEWS-001	Workstation for CEMS														

Legend  
CEMS                    Continuous Emission Monitoring system  
AAAS                    Ambient Air Analyzer system  
BTX                      Benzene, Toluene and Xylene