CO_2 Capture- BOD and Tender Specifications

Battery Limit List

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FROM: Worley energy | chemicals | resources — Advisian Worley Group

CLIENT: **AEB Amsterdam**

PLANT LOCATION: **Amsterdam, NL**

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Number	LINE INFORMATION		FLOW			OPERATING CONDITIONS		REMARKS
	INTERFACE POINT	SERVICE	NORMAL	MAX	Unit	PRESS. (at grade) barg	TEMP. °C	
1	1-BL-01	Treated Flue Gas to atmosphere	491,000	501,000	t/h	atm	43	
2	2-BL-01	Product CO_2 export to OCAP pipeline	60,017	64,500	kg/h	21	12	
3	3-BL-01	Liquified Product CO_2 to truck loading station	13,000-35,000 (Variable)	35,000	kg/h	15-18	TBD	Battery Limit considering CO_2 liquefaction plant (Optional Scope)
4	3-BL-02	Gaseous CO_2 from CO_2 liquefaction plant to OCAP pipeline	30,000	42,000	kg/h	7-21	<25	Battery Limit considering CO_2 liquefaction plant (Optional Scope); Minimum Flow: 18,000 kg/h
5	3-Bl-03	Gaseous CO_2 from OCAP pipeline to CO_2 liquefaction plant	TBD	35,000	kg/h	7-21	<25	Battery Limit considering CO_2 liquefaction plant (Optional Scope)
6	4-BL-11	Flue Gas from flue gas line L11 (AEC)	245,268	245,268	kg/h	atm	66	DN2600 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection.
7	4-BL-12	Flue Gas from flue gas line L12 (AEC)	245,268	245,268	kg/h	atm	66	DN2600 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection.
8	4-BL-23	Flue Gas from flue gas line L23 (AEC)	245,268	245,268	kg/h	atm	66	DN2600 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection.
9	4-BL-24	Flue Gas from flue gas line L24 (AEC)	245,268	245,268	kg/h	atm	66	DN2600 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection.
10	4-BL-35	Flue Gas from flue gas line L35 (HRC)	273,960	273,960	kg/h	atm	66	DN2800 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection
11	4-BL-36	Flue Gas from flue gas line L36 (HRC)	273,960	273,960	kg/h	atm	66	DN2800 Flue Gas Duct; indicated flow is the total flue gas flow rate upstream tie-in connection
12	5-BL-01	Harbor water supply to PCW intake	TBD	8,391	m^3/h	4	22 25 (max)	Harbor water supply from Aziëhaven; PCW intake may increase if FG input flow is increased, and/or due to lower DCC/absorber working temperature. To be confirmed in next phase. PCW intake velocity not to exceed 0.3 m/s.
13	5-BL-02	PCW return to PCW discharge line to harbor	TBD	8,391	m^3/h	3.3 3 (min)	33.6 35 (max)	Harbor water discharge to Aziëhaven; PCW return may increase if FG input flow is increased, and/or due to lower DCC/absorber working temperature. To be confirmed in next phase.
14	5-BL-03	PCW supply to CO_2 liquefaction plant	TBD	800	m^3/h	4	22 25 (max)	Battery Limit considering CO_2 liquefaction plant (Optional Scope)
15	5-BL-04	PCW return from CO_2 liquefaction plant	TBD	800	m^3/h	3.3 3 (min)	33.6 35 (max)	Battery Limit considering CO_2 liquefaction plant (Optional Scope)
16	6-BL-01	LP steam from AEC LP steam header	72,000	TBD	kg/h	3	168	DN500 (20 inch) pipe

Number	LINE INFORMATION		FLOW			OPERATING CONDITIONS		REMARKS
	INTERFACE POINT	SERVICE	NORMAL	MAX	Unit	PRESS. (at grade) barg	TEMP. °C	
17	6-BL-02	LP condensate from PCC plant to AEC	72,000	TBD	kg/h	3	140	DN100 (4 inch) pipe
18	7-BL-01	Feed water supply to DWU from Basin 5	15	15	m^3/h	TBD	4 (min) 20 (max)	
19	7-BL-02	Potable Water Supply to CO_2 capture plant (WP1)	TBD	TBD	m^3/h	TBD	4 (min) 20 (max)	
20	7-BL-03	Potable water direct supply to DWU	15	15	m^3/h	TBD	4 (min) 20 (max)	
21	8-BL-01	Brine from FGCTP to AEC ARA 10/20	3	3	m^3/h	2.5	38	
22	8-BL-02	Treated FG condensate to existing CWR line of HRC/AEC	62	62	m^3/h	2.5	38	
23	9-BL-01	Brine/Effluent from DWU to existing CWR line of HRC/AEC	1.9	1.9	m^3/h	atm	TBD	
24	11-BL-01	Firewater from existing network	TBD	TBD	m^3/h	TBD	TBD	
25	11-BL-02	Clean Rainwater/Surface water discharge from retention tank to harbor	TBD	TBD	m^3/h	TBD	TBD	Discharge into Aziehaven
26	11-BL-03	Wastewater/Contaminated Rainwater or surface water discharge from retention tank to MWWT	TBD	10	m^3/h	TBD	TBD	Discharge to municipal wastewater treatment (MWWT) plant
27	12-BL-01	AEC Condensate Supply To PCC	210,519	300,000	kg/h	TBD	40-60	
28	12-BL-02	Heated Condensate Return to AEC	210,519	300,000	kg/h	TBD	90 (max)	
29	13-BL-01	Instrument Air to Liquefaction Unit	TBD	TBD	m^3/h	7 8(max)	22 25(max)	
30	14-BL-01	Power supply to 10kV station	1080	1,256	kVA	N/A	N/A	
31	14-BL-02	Power supply to CO_2 liquefaction plant	2,665	2,800	kVA	N/A	N/A	
32	16-BL-01	Amine solvent to CO_2 capture plant	TBD	200	t/a	TBD	TBD	
33	16-BL-02	Caustic (NaOH) supply from existing tank(s) AEC/HRC	TBD	20	t/a	TBD	TBD	
34	16-BL-03	HCl supply from existing tank(s) AEC/HRC to DWU	TBD	25.5	t/a	TBD	TBD	
35	16-BL-04	Sulphuric acid (H_2SO_4) supply	TBD	169	t/a	TBD	TBD	

Number	LINE INFORMATION		FLOW			OPERATING CONDITIONS		REMARKS
	INTERFACE POINT	SERVICE	NORMAL	MAX	Unit	PRESS. (at grade) barg	TEMP. °C	
36	16-BL-05	Anti-foaming agent supply	TBD	150	t/a	TBD	TBD	
37	16-BL-06	Anti-scalant supply to FGCTP	2.4	TBD	t/a	TBD	TBD	
38	16-BL-07	Lube oil supply to storage	TBD	TBD	t/a	TBD	TBD	
39	16-BL-08	N_2 supply to DWU	80.1	TBD	t/a	TBD	TBD	

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Number	SERVICE	FROM	TO	REMARKS
1	PCC Process control system (SAS)	CCR building	E&I Container-I&C Room at PCC	EPC contractor's scope covers from the PCC plant's work stations,servers and associated systems in the CCR building to the new process control systems(SAS) in the E&I container room in the PCC area and to the package control systems. Interfacing of PCC system signals to the existing ABB Procontrol P14 control system and its modification to execute this activity is also under bidder scope.
2	Instrument and control main cable to CCR from PCC plant	E&I Container-I&C Room at PCC	CCR building	EPC contractor shall procure and linstall all the digital and analog cables for the monitoring and control of the PCC plant from the I&C room to the CCR building. The interfacing signal cables and it's installation between PCC control system and ABB Procontrol P14 is also under bidder scope.
3	Instrument and control main cable ladder tray	AEC/HRC -PCC plant tie-in point	E&I Container-I&C Room at PCC	All the required cable ladder trays for the above mentioned cables shall be installed by the EPC contractor
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Number	SERVICE	FROM	TO	REMARKS
1	Main 10 kV incoming feeder cables	Electrical Substation tie-in point	E&I Container-Switchgear Room at PCC	EPC contractor's scope covers procurement of 10 kV incoming feeder cables and their interface with circuit breakers in E&I container. The scope also covers all provisions for measurement and monitoring of consumed power.
2	U/G cable installation of incoming feeder cables	Electrical Substation tie-in point	E&I Container-Switchgear Room at PCC	EPC contractor shall be responsible for underground laying of incoming cables.
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