FORBES

Document title: Site Acceptance Test (SAT) Procedure
Forbes job ref.: 98702
Document no.: ATOX-FOR-Z2-ZZ-PD-P-0002
Revision: 2
Date: 08/02/21

Test signatories

1) SAT procedure approval.

Name	Company	Role	Signature	Date
DAVID ADAMS	ALMAC	JUNIOR PROJECT ENGINEER	*D.*	08 FEB 2021
TIMOTHY KINGSNORTH	ALMAC	SYSTEM SUPPORT ENGINEER		08 Feb 2021

2) The table below will be completed by all members present at the SAT:

Name	Company	Role	Signature	Date
BEN WHICKER	FORBES	CHEMICAL ENG.	*Bn*	08/02/21.
DAVID ADAMS	ALMAC	JUNIOR PROJECT ENGINEER	*D.*	08FEB2021
TIMOTHY KINGSNORTH	ALMAC	SYSTEM SUPPORT ENGINEER		08 FEB 2021

Introduction

Each scrubber will be tested individually, starting with 101 and ending with 103. The procedure will be the same for each.

Any incident identified during SAT will be recorded on Forbes test incident report form (ATOX-FOR-Z2-ZZ-TR-PM-0001).

Refer to following drawings:

- B40446 – Rev 6 – HCl and VOC scrubber P&ID (101) (ATOX-FOR-Z2-XX-DR-P-0001)
- B40447 – Rev 4 – HCl and VOC scrubber P&ID (102) (ATOX-FOR-Z2-XX-DR-P-0002)
- B40473 – Rev 4 – HCl and VOC scrubber P&ID (103) (ATOX-FOR-Z2-XX-DR-P-0003)

Hydrostatic testing – filling may take place prior the SAT

3) Ensure the following valves are in the closed position.

    a. Sump outlet isolation valve (V101; V201; V301)

    b. Sump drain valve (V120; V220; V320)

    c. Sump sample valves (V121; V122; V221; V222; V321; V322)

4) Ensure sump access manway cover is fully secured.

5) Fill scrubber sump with water, either via hose or through water fill line if possible. Fill until overflow level is reached.

6) Check for signs of leakage following 12-hour period.

	Pass	Fail	Comments
101	☑	☐	
102	☑	☐	
103	☑	☐	

Name	Signature	Date
BEN WHICKER (Forbes)	*Bn*	10/02/21
David Adams (Almac/Arran)	*P. R*	12 Feb 2021

Visual inspections

7) A full inspection of the setup will be completed. In particular, the following will be confirmed:

    a. Termination points are in expected locations and are connections are as specified (i.e. flange standards, thread size) – refer to drawings for details.

    b. All pipe and valve sizes are as specified.

    c. All motor sizes are as specified – refer to parts lists (ATOX-FOR-Z2-ZZ-DR-M-0034; ATOX-FOR-Z2-ZZ-DR-M-0035; ATOX-FOR-Z2-ZZ-DR-M-0036).

    d. Instrument & equipment make and models are as specified and are installed correctly – refer to instrumentation list (ATOX-FOR-Z2-XX-SP-CN-0001) & parts lists.

    e. Dimensional checks

    f. Check pneumatic air lines are installed and connected correctly.

    g. Check warning labels are installed on seal pots.

    h. Check earthing rod is installed (not within Forbes scope).

	Item	Pass	Fail	Comments
101	Termination points	☑	☐	
	Pipe & valve sizes	☑	☐	V108 need moving upstream of FT on P110. TI104.
	Motor sizes	☑	☐	
	I&E makes and models	☑	☐	Downstairs ✓
	Scrubber & nozzles	☑	☐	Downstairs ✓
	Spray nozzle	☑	☐	
	Demister	☑	☐	
	Packing media	☑	☐	D.Adams viewed on install. Video of internals taken during commissioning.
	Dimensional checks	☑	☐	

	Item	Pass	Fail	Comments
	Pneumatic air lines	☑	☐	
	Warning labels on seal pots	☑	☐	
	Earthing rod	☐	☑	Needs wiring T101
	Other comments	N/A	N/A	Tags required for instruments. T102.

Name	Signature	Date
BEN WHICKER (Forbes)	*[signature]*	12/02/21.
David Adams (Almac/Arran)	*[signature]*	12 Feb 2021

	Item	Pass	Fail	Comments
102	Termination points	☑	☐	
	Pipe & valve sizes	☑	☐	XT08, V208, V308 needs to move upstream of FT. (T104.)
	Motor sizes	☑	☐	
	I&E makes and models	☑	☐	Donaldson ✓
	Scrubber & nozzles	☑	☐	Donaldson
	Spray nozzle	☑	☐	

Item	Pass	Fail	Comments
Demister	☑	☐	
Packing media	☑	☐	See 101.
Dimensional checks	☑	☐	
Pneumatic air lines	☑	☐	
Warning labels on seal pots	☑	☐	
Earthing rod	☐	☑	Needs wiring. TI01.
Other comments	N/A	N/A	Tags required for instruments TI02.

Name	Signature	Date
BEN WHICKER (Forbes)	B	12/02/21
David Adams (Almac/Arran)	P. W	12 Feb 2021

	Item	Pass	Fail	Comments
103	Termination points	☑	☐	
	Pipe & valve sizes	☐	☑	v308 needs moving upstream of FT. (TI04.)
	Motor sizes	☑	☐	
	I&E makes and models	☑	☐	Downstream ✓

Item	Pass	Fail	Comments
Scrubber & nozzles	☑	☐	
Spray nozzle	☑	☐	
Demister	☑	☐	
Packing media	☑	☐	See 101.
Dimensional checks	☑	☐	
Pneumatic air lines	☑	☐	
Warning labels on seal pots	☑	☐	
Earthing rod	☐	☑	Needs wiring / TI 01.
Other comments	N/A	N/A	Tags required for instruments TI 02.

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21
David Adams (Almac/Arran)		12Feb 204

The scrubbers will also be tested using a gas stream containing hydrochloric acid (HCl), with the inlet and outlet concentrations being monitored. Details are TBC by Almac/Arran.

Control panels

8) Check the control panels for the following:

	Item	Pass	Fail	Comments
101	Ingress protection rating	☑	☐	
	Defeatable isolator	☑	☐	
	Wiring segregation	☑	☐	
	Temperature rise calculation	☑	☐	
	Visual inspection	☑	☐	
	Panel drawing comparison	☑	☐	

Name	Signature	Date
BEN WHITKER (Forbes)	*(signature)*	12/02/21
David Adams (Almac/Arran)	*(signature)*	12 Feb 2021

	Item	Pass	Fail	Comments
102	Ingress protection rating	☑	☐	
	Defeatable isolator	☑	☐	
	Wiring segregation	☑	☐	
	Temperature rise calculation	☑	☐	
	Visual inspection	☑	☐	
	Panel drawing comparison	☑	☐	

Name	Signature	Date
BEN WHITKER (Forbes)		12/02/2(1
David Adams (Almac/Arran)		12 Feb 2021

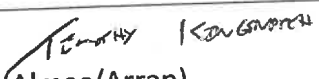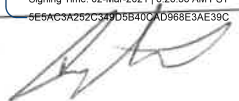|	Item	Pass	Fail	Comments
103	Ingress protection rating	☑	☐	
	Defeatable isolator	☑	☐	
	Wiring segregation	☑	☐	
	Temperature rise calculation	☑	☐	
	Visual inspection	☑	☐	
	Panel drawing comparison	☑	☐	

Name	Signature	Date
BEN WHITKER (Forbes)		12/02/11
David Adams (Almac/Arran)		12 Feb 2021

Human-machine interface (HMI)

9) Check the HMIs for the following:

	Item	Pass	Fail	Comments
101	Display as P&ID	☑	☐	
	Colours	☑	☐	
	Security	☑	☐	T105 - Forbes advise admin codes / add new users
	Audit trail	☐	☑	
	Alarms	☑	☐	
	Setpoints	☑	☐	
	Transitions	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: Bw Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:26:36 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
TIMOTHY KINGWORTH (Almac/Arran)		17 Feb 2021

	Item	Pass	Fail	Comments
102	Display as P&ID	☑	☐	
	Colours	☑	☐	
	Security	☑	☐	
	Audit trail	☐	☑	
	Alarms	☑	☐	
	Setpoints	☑	☐	
	Transitions	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: Bw Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:26:55 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
TIMOTHY KINGWORTH (Almac/Arran)		17 Feb 2021
David Adams	D. Adam	17 Feb 2021

18 Feb 2021

	Item	Pass	Fail	Comments
103	Display as P&ID	☑	☑	ID's not shown TI15
	Colours	☑	☐	
	Security	☑	☐	
	Audit trail	☐	☑	
	Alarms	☑	☐	
	Setpoints	☑	☐	
	Transitions	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:27:27 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
TIMOTHY KINGSNORTH (Almac/Arran)	*[signature]*	17 Feb 2021
David Adams	D. MC	17 Feb 2021

Testing setup of instrumentation and telemetry signals

10) Check the range and signals from all instruments are as specified in the Input / Output (I/O) List (ATOX-FOR-Z2-XX-SP-CN-0003).

	Instrument	Range OK	Signal OK	Comments
101	LS-7012-0001	N/A	☑	
	LS-7012-0002	N/A	☑	
	LIT-7012-0001	☑	☑	
	PDIT-7012-0001	☑	☑	
	PIT-7012-0001	☑	☑	
	FIT-7012-0002	☑	☑	
	FIT-7012-0003	☑	☑	
	AIC-7012-0001	☑	☑	
	TIT-7012-0001	☑	☑	

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21.
David Adams (Almac/Arran)	D. Da	12Feb2021

	Instrument	Range OK	Signal OK	Comments
102	LS-7013-0001	N/A	N/A	Relay in panel needs changing. T103
	LS-7013-0002	N/A	N/A	
	LIT-7013-0001	☑	☑	
	PDIT-7013-0001	☑	☑	
	PIT-7013-0001	☑	☑	
	FIT-7013-0002	☑	☐	
	FIT-7013-0003	☑	☑	
	AIC-7013-0001	☐	☑	
	TIT-7013-0001	☑	☑	

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21.
David Adams (Almac/Arran)	D.	12Feb2021

	Instrument	Range OK	Signal OK	Comments	
103	LS-7014-0001	N/A	N/A	Relay in panel needs changing	T103
	LS-7014-0002	N/A	N/A		
	LIT-7014-0001	☐	☐		
	PDIT-7014-0001	☒	☒	Fault. Instrument to be replaced/ T106. repaired	
	PIT-7014-0001	☑	☑		
	FIT-7014-0002	☒	☒	Fault. To be repaired. T107	
	FIT-7014-0003	☑	☑		
	AIC-7014-0001	☑	☑	Warning on pH probe T108.	
	TIT-7014-0001	☑	☑		

Name	Signature	Date
Ben WHICKER (Forbes)	*[signature]*	12/02/21
David Adams (Almac/Arran)	*[signature]*	12 Feb 2021

Testing functionality of pumps and fans

11) With the sump sufficiently filled with water, all relevant valves in the correct positions and the control panel in maintenance mode, activate and check function and rotation (if applicable) of the following equipment. Measure noise level of each piece of equipment (dBA @ 1 m). *Sump level will need to be below high level setpoint to test the dosing pump.*

    a. Recirculation pump (PN-7012-001; PN-7013-001; PN-7014-001)

    b. Dosing pump (PN-7012-002; PN-7013-002; PN-7014-002)

    c. Fan (FN-7012-001; FN-7013-001; FN-7014-001)

	Equipment	Function	Feedback	Noise	Comments
101	PN-7012-001	☑	☑	~~80 dBA@1m~~	Difficult to measure with background noise - < 80 dBA@1m.
	PN-7012-002	☑	☒ N/A		As PN-7012-001
	FN-7012-001	☑	☑	80 dB(A)@1m	

Name	Signature	Date
BEN WHITKER. (Forbes)	*(signature)*	12/02/21
David Adams (Almac/Arran)	*(signature)*	12 Feb 2021

	Equipment	Function	Feedback	Noise	Comments
102	PN-7013-001	☑	☑	.	Negliagable
	PN-7013-002	☑	☒ N/A		Neglgable
	FN-7013-001	☑	☐	79 dB@1m.	

Name	Signature	Date
BEN WHITKER (Forbes)	*(signature)*	12/0c/21
DAVID ADAMS (Almac/Arran)	*(signature)*	17 Feb 2021

	Equipment	Function	Feedback	Noise	Comments
103	PN-7014-001	☑	☑	/	negligable
	PN-7014-002	☑	☑ N/A	/	negligable
	FN-7014-001	☑	☑	75 dB@ 1m	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:27:54 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
David Adams (Almac/Arran)	*D. Adw*	17 Feb 2021

Timothy Kingsnorth   *[signature]*   17 Feb 2021

Testing functionality of actuated valves

12) With the actuated valve isolation valves closed and the control panel in maintenance mode, activate and check function of the following equipment. *Sump level will need to be below water fill level setpoint to test the water fill valve.*

     a. Caustic fill valve (V115 (XCV 7012-0004); V215 (XCV 7013-0004); V315 (XCV 7014-0004))

     b. Water fill valve (V118 (XCV 7012-0003); V218 (XCV 7013-0003); V318 (XCV 7013-0003))

	Instrument	Function	Feedback	Comments
101	V115 (XCV 7012-0004)	☑	☑	
	V118 (XCV 7012-0003)	☑	☑	

Name	Signature	Date
BEN WHICKER (Forbes)	*Bw*	12/02/21.
David Adams (Almac/Arran)	*D. Adw*	12 Feb 2021

	Instrument	Function	Feedback	Comments
102	V215 (XCV 7013-0004)	☑	☑	
	V218 (XCV 7013-0003)	☑	☑	

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21.
David Adams (Almac/Arran)		12 Feb 2021

	Instrument	Function	Feedback	Comments
103	V315 (XCV 7014-0004)	☑	☑	
	V318 (XCV 7014-0003)	☑	☑	Ball valve siezed. Replacement arranged. ~~Fred~~ TIII

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21
David Adams (Almac/Arran)		12 Feb 2021

Testing of sample points

13) Test sample points in sumps and recirculation pipework.

	Item	Function	Comments
101	Sump	☑	
	Recirculation	☑	

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21
David Adams (Almac/Arran)		12Feb 2021

	Item	Function	Comments
102	Sump	☑	
	Recirculation	☑	Valve orientation. T109.

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21
David Adams (Almac/Arran)		12Feb 2021

	Item	Function	Comments
103	Sump	☐	
	Recirculation	☐	

Name	Signature	Date
BEN WHICKER (Forbes)		12/02/21
David Adams (Almac/Arran)		12Feb 2021

Testing of telemetry signals

14) Check the function and signals from all outputs as specified in I/O list (ATOX-FOR-Z2-XX-SP-CN-0003).

	Alarm	Function	Signal OK	Comments
101	System ready	☑	☑	
	Critical alarm	☐	☑	
	Warning alarm	☑	☐	

Alarm	Function	Signal OK	Comments
Maintenance mode	☑	☑	
Fan running	☑	☑	
Sump HiHi level	☑	☑	
Sump LoLo level	☑	☑	
Tower recirc. Lo flow	☑	☑	
Venturi recirc. Lo flow	☑	☑	
Packed bed Hi	☑	☑	
Packed bed Lo	☑	☑	
pH LoLo	☑	☑	
System inlet pressure Hi	☑	☑	
Water fill valve open	☑	☑	
Water fill valve closed	☑	☑	
Caustic fill valve open	☑	☑	
Caustic fill valve closed	☑	☑	
Emergency stop healthy	☑	☑	
Recirculation pump running	☑	☑	
Fan running	☑	☑	
Fan fault	☑	☑	
Tower recirc. flow	☑	☑	
Venturi recirc. flow	☑	☑	
Packed bed dP	☑	☑	
pH	☑	☑	
System inlet pressure	☑	☑	

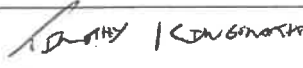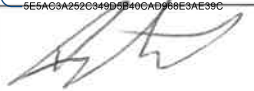| Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:28:11 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
Timothy Kingheorth (Almac/Arran)	*[signature]*	17 Feb 2021
David Adams	*[signature]*	17 Feb 2021

Alarm	Function	Signal OK	Comments
System ready	☑	☑	
Critical alarm	☑	☑	
Warning alarm	☑	☑	
Maintenance mode	☑	☑	
Fan running	☑	☑	
Sump HiHi level	☑	☑	
Sump LoLo level	☑	☑	
Tower recirc. Lo flow	☑	☑	
Venturi recirc. Lo flow	☑	☑	
Packed bed Hi	☑	☑	
Packed bed Lo	☑	☑	
pH LoLo	☑	☑	
System inlet pressure Hi	☑	☑	
Water fill valve open	☑	☑	
Water fill valve closed	☑	☑	
Caustic fill valve open	☑	☑	
Caustic fill valve closed	☑	☑	
Emergency stop healthy	☑	☑	
Recirculation pump running	☑	☑	
Fan running	☑	☑	
Fan fault	☑	☑	
Tower recirc. flow	☑	☑	
Venturi recirc. flow	☑	☑	
Packed bed dP	☑	☑	
pH	☑	☑	
System inlet pressure	☑	☑	

102

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:28:45 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
Timothy Kingsnorth (Almac/Arran)	*(signature)*	17 Feb 2021
David Adams	D. Kerr	17 Feb 2021

	Alarm	Function	Signal OK	Comments
103	System ready	☑	☑	
	Critical alarm	☑	☑	
	Warning alarm	☑	☑	
	Maintenance mode	☐	☐	
	Fan running	☑	☑	
	Sump HiHi level	☑	☑	
	Sump LoLo level	☑	☑	
	Tower recirc. Lo flow	☑	☐	
	Venturi recirc. Lo flow	☑	☑	
	Packed bed Hi	☑	☑	
	Packed bed Lo	☒	☒	TI06
	pH LoLo	☑	☑	
	System inlet pressure Hi	☑	☑	
	Water fill valve open	☑	☑	
	Water fill valve closed	☑	☑	
	Caustic fill valve open	☑	☑	
	Caustic fill valve closed	☑	☑	
	Emergency stop healthy	☑	☑	
	Recirculation pump running	☑	☑	
	Fan running	☑	☑	
	Fan fault	☑	☑	
	Tower recirc. flow	☑	☑	
	Venturi recirc. flow	☑	☑	
	Packed bed dP	☒	☒	TI06
	pH	☑	☑	

	Alarm	Function	Signal OK	Comments
	System inlet pressure	☑	☑	

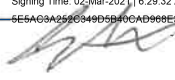| Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:29:09 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
Timothy Kingsnorth (Almac/Arran)	*[signature]*	17 Feb 2021

David Adams   *D. [signature]*   17 Feb 2021

Interlocks

Check all interlocks function as expected.

15) Recirculation pump (PN-7012-001 / PN-7013-001 / PN-7014-001) will be deactivated by any of the following:

   a. Sump contents fall below low-low level switch (LS-7012-0002 / LS-7013-0002 / LS-7014-0002).

16) Dosing pump (PN-7012-002 / PN-7013-002 / PN-7014-002) will be deactivated by any of the following:

   a. Sump contents rise above high level (configurable setpoint from LT-7012-0001 / LT-7013-0001 / LT-7014-0001).

   b. Sump contents rise above high-high level switch (LS-7012-0001 / LS-7013-0001 / LS-7014-0001).

17) Actuated valve in caustic fill line (V115 (XCV 7012-0004); V215 (XCV 7013-0004); V315 (XCV 7014-0004)) is fail-safe to close and will be closed by any of the following:

   a. Sump contents rise above high level (configurable setpoint from LT-7012-0001 / LT-7013-0001 / LT-7014-0001).

   b. Sump contents rise above high-high level switch (LS-7012-0001 / LS-7013-0001 / LS-7014-0001).

18) Actuated valve in water fill line ((V118 (XCV 7012-0003); V218 (XCV 7013-0003); V318 (XCV 7013-0003))) is fail-safe to close and will be closed by any of the following:

   a. Sump contents rise above water fill level (configurable setpoint from LT-7012-0001 / LT-7013-0001 / LT-7014-0001).

   b. Sump contents rise above high level (configurable setpoint from LT-7012-0001 / LT-7013-0001 / LT-7014-0001).

   c. Sump contents rise above high-high level switch (LS-7012-0001 / LS-7013-0001 / LS-7014-0001).

19) E-stop will stop all equipment.

	Interlock	Pass	Fail	Comments
101	PN-7012-001 Low-low level	☑	☐	
	PN-7012-002 High level	☑ N/A	☐	
	PN-7012-002 High-high level	☑ BW	☐	
	V115 (XCV 7012-0004) High level	☐ N/A	☐	
	V115 (XCV 7012-0004) High-high level	☑	☐	
	V118 (XCV 7012-0003) Water level	☑	☐	
	V118 (XCV 7012-0003) High level	☑	☐	
	V118 (XCV 7012-0003) High-high level	☑	☐	
	E-stop	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: BW Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:29:32 AM PST 5E5AC3A252C849D5B40CAD968E3AE39C	02-Mar-2021
Timothy Kavanagh (Almac/Arran)		17 Feb 2021

David Adams   D. Adams   17 Feb 2021

|	Interlock	Pass	Fail	Comments
102	PN-7013-001 Low-low level	☑	☑	
	PN-7013-002 High level	N/A	☐	
	PN-7013-002 High-high level	☑	☑	
	V215 (XCV 7013-0004) High level	N/A	☐	
	V215 (XCV 7013-0004) High-high level	☑	☑	
	V218 (XCV 7013-0003) Water level	☑	☑	
	V218 (XCV 7013-0003) High level	☑	☑	
	V218 (XCV 7013-0003) High-high level	☑	☑	
	E-stop	☑	☑	

Name	Signature	Date
Ben whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:29:45 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
Timothy KINGSNORTH (Almac/Arran)		17 Feb 2021
David Adams	P. M	17 Feb 2021

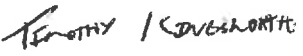| Interlock		Pass	Fail	Comments
103	PN-7014-001 Low-low level	☑	☐	
	PN-7014-002 High level	N/A	☐	
	PN-7014-002 High-high level	☑	☐	
	V315 (XCV 7014-0004) High level	N/A	☐	
	V315 (XCV 7014-0004) High-high level	☑	☐	
	V318 (XCV 7014-0003) Water level	☑	☐	
	V318 (XCV 7014-0003) High level	☑	☐	
	V318 (XCV 7014-0003) High-high level	☑	☐	
	E-stop	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: Bn Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:29:58 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
Timothy Conesworth (Almac/Arran)	*(signature)*	17 Feb 2021
David Adams	D. *(signature)*	17 Feb 2021

Full wet run test

20) Run the scrubber in Auto mode and confirm the controls function as described in the control philosophy (ATOX-FOR-Z2-XX-SP-CN-0004).

	Function	Pass	Fail	Comments
101	Manual operation	☑	☐	Note fan speed changeable in maint mode.
	Auto scrubber fill	☑	☐	
	Auto scrubber start	☑	☐	
	Auto scrubber empty	☑	☐	
	Additional dosing (external)	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bhw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:30:15 AM PST 5E5AC3A252C349D5B40CAD968E3AE39C	02-Mar-2021
TIMOTHY KINGSNORTH (Almac/Arran)		17 Feb 2021
DAVID ADAMS	P. M	17 Feb 2021

|	Function	Pass	Fail	Comments
102	Manual operation	☑	☐	
	Auto scrubber fill	☑	☐	
	Auto scrubber start	☑	☐	
	Auto scrubber empty	☑	☐	
	Additional dosing (external)	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bw* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021 | 6:30:27 AM PST 5E5AC3A252C349D5B40CAD968E8AE39C	02-Mar-2021
TIMOTHY KINGSNORTH (Almac/Arran)		17 FEB 2021

DAVID ADAMS   D. Am   17 Feb 2021

	Function	Pass	Fail	Comments
103	Manual operation	☑	☐	
	Auto scrubber fill	☑	☐	
	Auto scrubber start	☑	☐	
	Auto scrubber empty	☑	☐	
	Additional dosing (external)	☑	☐	

Name	Signature	Date
Ben Whicker (Forbes)	DocuSigned by: *Bh* Signer Name: Ben Whicker Signing Reason: I approve this document Signing Time: 02-Mar-2021	6:30:37 AM PST 5E5AC9A252C349D5B40CAD968E3AE39C	02-Mar-2021
TIMOTHY KINGSNORTH (Almac/Arran)		17 Feb 2021
David Adams	D.	17 Feb 2021

SAT sign-off

21)   Final sign-off to confirm SAT procedure is complete.

Name	Signature	Date
BEN WHICKER. (Forbes)		12/02/21
Timothy KINGSNORTH (Almac/Arran)		18 Feb 2021

T101 - Earthing rods in sump to be connected.
T102 - Instrument tags required.
T103 - HiHi relay from NC to No.
T104 - V108, V208, V308 needs to change position on P+ID
T105 - Admin login / new users on HMI.
T106 - PDIT to be repaired / replaced.
T107 - FIT to be repaired / replaced.
T108 - AIC probe warning.
T109 - 3-way valves position to be made more clear.
T110 - Alarms from panels to be fully tested by Almac.
T111 - Actuated ball valve to be replaced.
T112 - All setpoints to be confirmed and relayed to Almac/SC Controls
A1 scrubbers (1 and 2) tested at >5 kg/h HCl flow with average
HCl readings at outlet < 0.5 mg/m³.

A2 scrubber to be tested by Almac.

T113 - V115, V118, V215, V218, V315, V318 model needs changed on parts list
~~T113 - forbes to conf~~
T114 - PID to be updated, see attached.
T115 - Parts III missing from HMI