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DAF Plant Functional Description and Jalco Horsley Park

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CHEMICAL WATER TREATMENT | WASTEWATER & REUSE | PRE-TREATMENT & DESALINATION | CLEANING & HYGIENE

FUNCTIONAL DESCRIPTION

1. PROCESS

The process is designed to treat toll manufacturing and chemical formulation, production wastewater which will enable Jalco Horsley Park manufacturing facility to discharge treated effluent to Licenced Sydney Water Sewer. The system will treat, up to 30,000 litres of wastewater each production day.

Wastewater from production Pit 1 will be transferred to the Balance Tank by a submersible pump.

The Process Flow is shown to drawing JAL-PFD-001 and the plant layout is shown to drawing: JAL-PFD-002

1.1 Balance Tank (capacity 50,000 litres)

When Balance Tank (T1) is above 30% of its level, transfer pump (P1) will run delivering >5kl per hour flow (controlled/ regulate by Process Control Valve -PCV1) to the Intermediate tank. This will continue until Balance Tank (T1) level reaches 30%. High level Alarm will warn of increased capacity at 85% level of Balance Tank level. Normal operating levels are from 30 – 70 percent.

ORP probe will be installed in the Balance Tank. Once Balance Tank reaches 30%, Sodium Metabisulphite dosing pump (DP1) will activate depending on the REDOX value measured by the ORP Controller reading/setpoint. Dosing pump (DP1) activation will stop dosing below 30% of Balance Tank level.

Aeration manifold shall be installed the balance Tank and the Air Solenoid Valve for Balance Tank (S1) shall generally remain ON all the time.

ORP Controller (OPC) will be powered ON all the time with dosing control sequenced on and off set against the level measured in the tank.

1.2 Intermediate Tank (capacity 22,500 litres)

When Balance Tank (T1) level is above 30% of its level as indicated by (L1), Process Control Valve (PCV1) opens, transfer pump (P1) will run delivering greater than (>) 5kl per hour flow to the Intermediate tank, after 10s delay. When L1 activates; the Intermediate Tank Mixer (M1) will start. There will be flow switch at the discharge line of P1. When flow switch activates, this will start Ferrous Sulphate (DP2), Acid (DP3) and Hydrogen Peroxide (DP4) dosing pumps going to the Intermediate Tank and is dosed proportional to the volume transferred. Acid dosing pump activates depending on the pH Controller reading/ setpoint.

pH sensor (PHP1) is installed to the intermediate tank.

2. OPERATING SEQUENCE

2.1. WASTEWATER TREATMENT PROCESS

2.1.1 START OPERATION

Initiated by a signal from the level sensor (L2) in Intermediate Tank, T2 when it reaches 70%.

2.1.2 DAF SUPPLY

When level of T2 reaches 70% as indicated by (L2), DAF Feed Pump (P2) will start after 3 minutes delay from activation. After 3 minutes, PCV2 will open, P2 will start and will continue until T2 level reaches 30%, then DAF go on shutting down mode. P2 has a capacity of 3000 - 5000 litres per hour; controlled by Variable Speed Drive (VSD).

2.1.3 DAF

Upon activation of L2 at 70% level in Intermediate Tank, DAF Reaction Tank Mixer (M1), DAF Effluent Tank Mixer (M3), DAF Scrapper Motor (MT1), DAF Recycle Pump (P8) starts.

DAF Recycle Air Solenoid (S2) opens.

2.1.4. DOSING

Upon activation of L2 at 70% level in Intermediate Tank, Coagulant Dosing Pump (DP5) will start. Polymer Dosing Pump (DP6) starts when P2 starts.

2.1.5. ACTIFLOX MK11 1200, pH & ORP

pH (PHC1, PHC2) & ORP (OPC) controllers, flocculant make up system (primary), discharge flow meter (FM) & discharge pump circuit (P3 & P4) need be operational whether the operation selection is Manual or Automatic

2.1.6. DAF SLUDGE PUMP

DAF Sludge Pump (P5) starts and stops depending when high and low level from L4 has been reached.

2.1.7 DAF SLUDGE TANK (capacity 22,500 litres)

DAF Sludge Tank (T3) will incorporate air diffuser manifold. Air Solenoid Valve to the manifold shall operate to present tank levels or timer. Level Sensor (L3) will initiate an alarm condition at 75% of T3 height, to inform operators to arrange a pump out or undertaken dewatering of the sludge tank; this alarm can be overridden. Secondary alarm will be initiated 90% of T3 height, a high level alarm will set as audible and visual alarm with the condition requiring immediate attention. The high alarm condition can be rest momentarily, but not overridden.

2.1.6. STOP OPERATION

When low level in Intermediate Reaction Tank (T2) is below (30%), DAF Feed Pump (P2) stops and Process Control Valve (PCV1) closes. DAF Reaction Tank Mixer (M2) and DAF Effluent Tank Mixer (M3), Coagulant Dosing Pump (DP5) and Polymer Dosing Pump (DP6) stop. After 3 mins of low level in the T2, DAF Recycle Air Solenoid (S2) closes, DAF Recycle Pump and DAF Scrapper Motor stops.

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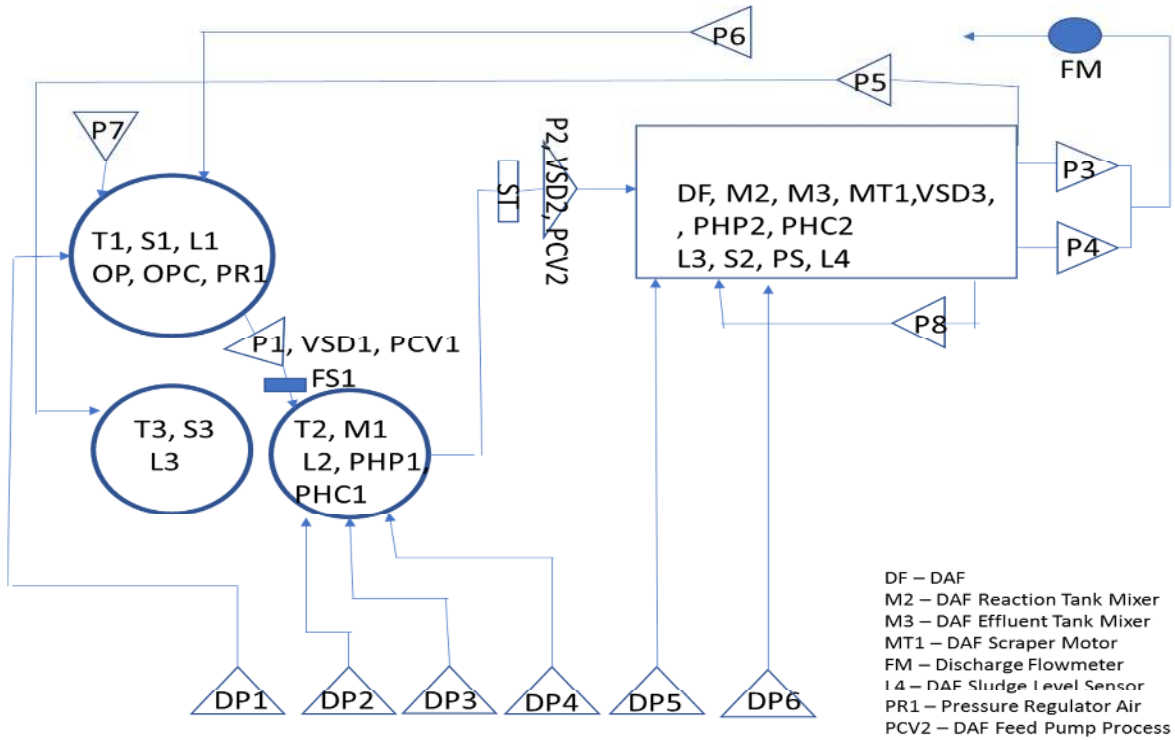
JALCO HORSLEY PARK FLOW SCHEMATIC



DF – DAF
M2 – DAF Reaction Tank Mixer
M3 – DAF Effluent Tank Mixer
MT1 – DAF Scraper Motor
FM – Discharge Flowmeter
L4 – DAF Sludge Level Sensor
PR1 – Pressure Regulator Air
PCV2 – DAF Feed Pump Process Control Valve

P1 – Transfer pump Balance Tank to Intermediate Tank
P2 – DAF feed pump
P3 – DAF discharge pump 1
P4 – DAF discharge pump 2
P5 Sludge pump
P6 – Sump pump 1
P7 – Sump pump 2
T1 – Balance Tank
S1 – Air solenoid valve for Balance Tank
L1 – Level Sensor/switch
T2 – Intermediate Tank
M1 – Mixer Intermediate Tank
L2 – Level Sensor Switch
T3 – Sludge Tank
S3 – Air Solenoid valve for Sludge Tank
L3 – Level Sensor/switch
DP1 – Sodium Metabisulphite Dosing Pump
DP2 – Ferrous Sulphate Dosing Pump
DP3 – Acid Dosing Pump
DP4 – Hydrogen Peroxide Dosing Pump
DP5 – Coagulant Dosing Pump
DP6 – Polymer Dosing Pump
VSD1 – Transfer Pump VSD Balance Tank to Intermediate Tank
PCV1 – Process Control Valve
FS1 – Flow Switch 1
OP – ORP Probe
OPC – ORP Controller
VSD2 – DAF Feed Pump VSD
VSD3 – DAF scrapper motor VSD
PHP1- DAF Reaction Tank pH Probe
PHC1 – Daf Reaction Tank pH controller
PHP2 – DAF Effluent pH probe
PHC2 – DAF Effluent pH controller
L3 – DAF effluent level sensor/switch
P8 – DAF Recycle Pump
S2 – DAF Recycle Air Solenoid Valve
PS – DAF Recycle Pressure Switch OR Pressure Transmitter