Gee and Company Effluent Treatment Plant

Stock No	BOT425
Manufacturer	Gee and Company
Year of Manufacture	2000
Condition	From a working environment, Good Condition
Other Info	** Open to sensible offers **
Location	Bude, Cornwall, UK

Description

Effluent Treatment System

** Open to sensible offers**

Plant design based on 200 to 250 m2 surface area of work processed per hour to meet the discharge consent applicable at time of installation (2000)

- PH - 6.0 - 10.0
- Suspended Solids - 500mg/l
- Zinc - 10mg/l
- Copper - 1mg/l
- Chromium - 2mg/l
-

Nickel - 1mg/l
- Oil and grease - 50mg/l
- COD - 1,500mg/l

** Please note that plant design will not remove COD however blending effluents will reduce peak concentration discharges.*

Specific requirement necessary for outfall pH monitoring and volumetric flow monitoring with additional facility to incorporate flow proportional sampling.

** Please note Chromium Reduction has been changed to pH correction as only trivalent passivates are now utilised*

Description of Plant Operation

Second stage low concentration rinse waters at a flow rate of 6.4m³/hr flow into pumping tank T16 for transfer into water purification train. Effluent firstly enters sand filter vessel V17 for solids removal before flowing into carbon filter vessel V18 where organic compounds are absorbed and therefore removed from the system.

From carbon filter vessel V18 effluents are transferred to either ion exchange train A or B by firstly entering cation exchange vessel V19 then flowing into anion exchange vessel V20for the removal of soluble ions. From vessel V20 effluents flow into return pumping module T21 for return to service.
T21 also supplies water for the purpose of backwashing sand filter and carbon filters vessels V17 & V18 where the purified water is conveyed to module T22 where solids are separated and bulk of the water returned for reprocessing via T16.

Facility is also incorporated to use raw mains water for the purpose of backwashing cation and anion exchange units. Regenerate effluents are conveyed to holding module T23 for slow bleed into either reaction module T3 or T4.

First stage rinse waters containing chromium flow into transfer tank T1 for conveyance into chromium reduction module T3. Here acid reagent and sodium bisulphite reagent are added automatically under pH and redox control to reduce chromium form hexavalent to trivalent form.

** Please note chromium reduction module T3 has been changed to pH correction utilising sodium hydroxide reagent as only trivalent passivates are now utilised*

Acid and alkali containing first stage rinse waters flow into pumping/transfer station T" for conveyance into precipitation reaction module T4 where they are joined by chromium based effluents after first stage treatment. Within reaction module T4 acid reagent or sodium hydroxide reagent is added automatically under pH control to obtain an optimum condition for metal precipitation.

From precipitation module T4 effluents flow to pumping module T5 for transfer into upward flow vertical sediment module T6. Within module T6 insoluble precipitated hydrated metal oxides and other associated solids separate to the bottom of the tank for direction into neutralisation reaction module T8. Solids separated within the bottom section module T6 are periodically tapped off into slurry holding module T7 for containment before being transferred through filter press for dewatering and disposal in solid form Filtrae extracted from the dewatering process will be returned for processing.

Effluents entering neutralisation reaction module T8 will be joined by cleaner phosphate effluents via the associated transfer sump/tank. Within reaction module T8 acid reagent or sodium hydroxide reagent is added automatically under pH control to obtain an optimum condition for effluent discharge.

From Module T8 effluents flow into outfall monitoring and recording module T9 where pH correction and volumetric flow are monitored and recorded before discharge is made.

Facility is incorporated within the design for the transfer, storage and slow bleed of concentrated waste process solutions. Waste process solutions are discharged into transfer station T1 and T2 during non production periods and conveyance into holding modules T10 and T11 is carried out by manual valve diversion. Waste process solutions will be contained within modules T10 and T11 and slowly bled into reaction modules T3 and T4 during rinse water transfer operations and therefore balancing out the effluent treatment chemistry.

Equipment Specification

- 1 off Pumping module T1 - 1m³ nominal capacity, of chemically resistant construction.
- 2 off Effluent transfer pumps for module T1 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T1, for pump cut out at low level and start up of standby pump and alarm at high level.

- 1 off Pumping module T2, 1m³ nominal capacity, of chemically resistant construction.
- 2 off Effluent transfer pumps for module T2 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T2, for pump cut out at low level and start up of standby pump and alarm at high level.

- 1 off Chromium reduction reaction module T3, 0.5m³ nominal capacity of chemically resistant construction.
- 1 off Mixer for module T3, with PVC coated shaft and paddle plus direct coupled TEFC motor.
- 1 off pH meter controller incorporating relays for control of acid reagent dosing pump, complete with pH electrode system.
- 1 off redox meter controller, incorporating relays for control of Sodium Bisulphite reagent dosing pump, complete with redox electrode system.

- 1 off precipitation reaction module T4, 1m³ nominal capacity, of chemically resistant construction
- *Please note: Module T3 no longer chromium reduction now pH correction*
- 1 off Mixer for module T4, with PVC coated shaft and paddle plus direct coupled TEFC motor.
- 1 off pH meter controller incorporating relays for control of acid reagent dosing pump, complete with pH electrode system.

- 1 off Pumping module T5, 1m³ nominal capacity, of chemically resistant construction.
- 2 off Effluent transfer pumps for module T5 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T5, for pump cut out at low level and start up of standby pump and alarm at high level.

- 1 off Upward flow vertical sedimentation module T6, 10m³ nominal capacity, of mild steel construction. Tank constructed complete with internal flow distribution system and peripheral outlet weir.
- 1 off Sludge holding module T7, 6m³ nominal capacity, integrally constructed with sedimentation module T6.

- 1 off Sludge transfer pump, of the air operated double acting diaphragm, suitably rated and constructed.
- 1 off Filter press unit model 420 x 20 chambers comprising 20 x 25mm recess chambers, drip tray, launder and hydraulic assisted opening and closing mechanism.

- Neutralisation reaction module T8, 0.5m³ nominal capacity of chemically resistant construction.
- 1 off Mixer for module T8, with PVC coated shaft and paddle plus direct coupled TEFC motor.
- 1 off pH meter controller incorporating relays for control of acid reagent dosing pump, complete with pH electrode system.

- 1 off Outfall monitoring and recording module T9, of the V-notch type complete with flow distribution system and v-notch end plate.
- 1 off pH meter indicator, complete with pH electrode system.
- 1 off Flow meter of pressure transducer type complete with probe assembly, meter and integrator.
- 1 off Two pen chart recorder for the simultaneous recording of the pH concentration and volumetric flow rate
- 1 off Warren Jones 24 hour composite sampler
- 1 off Acid containing concentrated waste process solution holding module T10, 4.5m³ nominal capacity, of chemically resistant construction.

- 1 off Bleed pump for controlled addition of waste process solution into reaction module T3.
- 1 off Dual level control for T1, for pump cut out and indication at low level and high level alarm.
- 1 off Acid reagent module T1, 1.8m³ nominal capacity of chemically resistant construction.
- 2 off Metering pumps for controlled addition of acid reagent into reagent modules T4 and T5 and injector associated with ion exchange regeneration.

- 1 off Dual level control system for module T12, to indicate need for reagent replenishment and high level alarm

- 1 off Sodium Hydroxide reagent module T13, 1.8m³ nominal capacity of chemically resistant construction.
- 3 off Metering pumps for controlled addition of alkali reagent into reaction modules T3. T4 and T8 and injector for ion exchange regeneration programme.

- 1 off Sodium bisulphite reagent module T14, 0.5m³ nominal capacity of chemically resistant construction.
- 1 off Metering pump for controlled addition of Sodium bisulphite reagent into reaction module T3
- 1 off Single level control system for module T14, to indicate need for reagent replenishment.
- *Please note: T14 no longer sodium bisulphite reagent now sodium hydroxide linked to T13 *

- 1 off Polyelectrolyte reagent module T15, 1m³ nominal capacity of chemically resistant construction.
- 1 off metering pump for controlled addition of Polyelectrolyte reagent to the inflow line of sedimentation module T6.
- 1 off Mixer for module T15, with stainless steel shaft, paddle and direct coupled TEFC motor
- 1 off Single level control system for module T15, to indicate need for reagent replenishment

- 1 off Pumping module T16, 10m³ nominal capacity of chemically resistant construction.
- 2 off Effluent transfer pumps for module T16 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T16, for pump out at low level and high level alarm

- 1 off Sand filter vessel V17, of the pressure vessel type1.2m Ø, complete with flow distribution system, underbed collection drain and sand media.

- 1 off Carbon filter vessel V18, of the pressure vessel type1.2m Ø, complete with flow distribution system, underbed collection drain and sand media.

- 2 off Ion exchange trains, cation and anion complete with charge of macro reticular resin, flow distribution system, automatic backwash and associated chemical injection and diversion values

- 1 off Return water holding module T21, 10m³ nominal capacity of chemically resistant construction.
- 2 off Transfer pumps for module T21 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T21, for pump cut out and indication at low level and high level alarm.

- 1 off Backwash water holding module T22, 12m³ nominal capacity of chemically resistant construction. Tank constructed complete with cone base and decant facility.
- 1 off Bleed pump for controlled addition of waste process solution into reaction module T4.

- 1 off Regenerant holding module T23, 10m³ nominal capacity of chemically resistant construction.
- 1 off Bleed pump/recirculation pump for module T23 of the centrifugal flooded suction type, suitably rated and constructed.
- 1 off Dual level control system for module T23, for pump cut out and indication at low level and high level alarm.

- 1 off Complete set of interconnecting PVC pipework and valves between equipment described above all being locally situated.
- 1 off Central control module, incorporating all pH meters, level controllers, starters, switchgear and comprehensive audible and visual alarms and lamp test facility.
- 1 off Complete set of electrical installation work between equipment described above and central control module, all being locally situated.
- 1 off Sodium Hypochlorite reagent dosing pump rated at 0.2 l/hour manually adjustable between 10 and 100% of max output complete with degassing head.
- 1 off Pressure pack pump system for feeding raw mains water from brake/raw water tank.
- 1 off Complete set of return and discharge pipework form plating line end manifold and effluent plant.
- 1 off Air operated double acting diaphragm pump to feed acid reagent to plating line complete with pneumatic control valve (spring loaded)
- 1 off Single pipeline for acid reagent feed run up gulley to terminate at end of plating line
- 1 off Single pipeline for acid reagent feed run up gulley to terminate at end of plating line.
- 1 off Set of water feed pipework from pressure pack run up gulley and terminating at end of plating line.

The effluent plant can be purchased as a complete facility along with the plating line as the preferred option or alternatively stand alone as a separate complete lot. However, any parties interested in purchasing specific equipment packages (indicative examples below) should register their interest and submit bids as these will be given serious consideration should the complete effluent plant not be sold as a complete lot.

Effluent Equipment Package Description

1 off	Main Control Panel

1 Set	Filter Press with tanks T6 Settlement, T7 Sludge Holding
1 Set	T9 Outfall Monitoring & T8 Final Neutralisation
1 Set	T16 Pumping, V17 Sand Filter, V18 Carbon Filter & T22 Filter Backwash.
1 Set	T23 Regen Handling, V19A & V19B Cation Exchange Unit, V20A & V20B Anion Exchange Unit & T21 Return Pumping
1 Set	Pumping Tanks T1 & T2
1 Set	Reagent Dosing Equipment, T12 Acid Reagent, T13 Alkaline Reagent T14 Alkaline Reagent & T15 Polyelectrolyte Reagent
1 Set	Waste Solution Holding Tanks T10 Acid & T11 Alkaline
1 Set	T3 pH Correction T4 Precipitation T5 Pumping.

The effluent plant comes complete a full information package of Operating and Maintenance Manuals, P&ID, wiring schematics etc. and the following spares.

Effluent Spares Description

2 off	30 metre coil 12mm ID x 20mm OD Reinforced PVC Hose
2 off	30 metre coil 6mm ID x 12mm OD Reinforced PVC Hose
1 off	Level Controller Type KMS1 5M
1 off	Spare Siata Valve Cam Block (used)
1 off	Calpeda C22E pump 1.5/6.6 M3/Hr 0.75HP
1 off	Elimamatic Polypropylene ½" Double Diaphragm Pump
1 off	Elimamatic Polypropylene ½" Double Diaphragm Pump (used)
2 off	GEE & Co. MPD53 Controllers
1 off	pH probe PS183-20B 1846
1 Box	Assorted Pumps Seals and Spares
1 Set	Service Reports (latest February 2020)

Photographs taken prior refurbishment. Our refurbishment service is not available on all machines.