

Textile Terry Towel Recycled Effluent Project

Step 1: Pre-qualification / Expression of interest

1. Introduction

Glodina Towelling (Pty) Ltd (Glodina) is a terry towel manufacturing in Hammarsdale, KwaZulu Natal, South Africa that weaves, dyes and finishes predominantly cotton products. An effluent treatment plant is in place that processes effluent from the dyehouse and sizing department for discharge to the municipal water treatment plant. We plan to install additional equipment to recycle 85% of our effluent for reuse as softened feed water to our dyehouse.

The site will also be increasing the extracted borehole water which will be treated in the proposed water treatment plant for the same purpose.

2. Expression of interest

Please complete Intent to Submit and Expression of Interest (Annexure1) and return so Glodina can determine the EOI from your company.

Based on the information received in response to this request, a shortlist of prospective turnkey suppliers will be compiled, and each will be requested to provide a detailed proposal (technical and commercial) with pricing in Step 2 of this application process.

To express your interest and to show your capability to supply a turnkey solution for this purpose, please provide the following information:

1. Company overview
2. References of similar projects in the textile industry that illustrate your capability to process textile factory (dyehouse and sizing department) effluent to meet the criteria for reuse as softened dyehouse feed water, with contact details.
3. Proposed technologies and process concept diagram
4. Evidence that the company can provide:
 - Project Management
 - Engineering design
 - Civil engineering / specifications for civil works
 - Equipment and all supporting infrastructure
 - Construction / Installation supervision
 - Skilled Labour for turnkey installation
 - Valid safety file
 - Check out
 - Commissioning
 - Startup

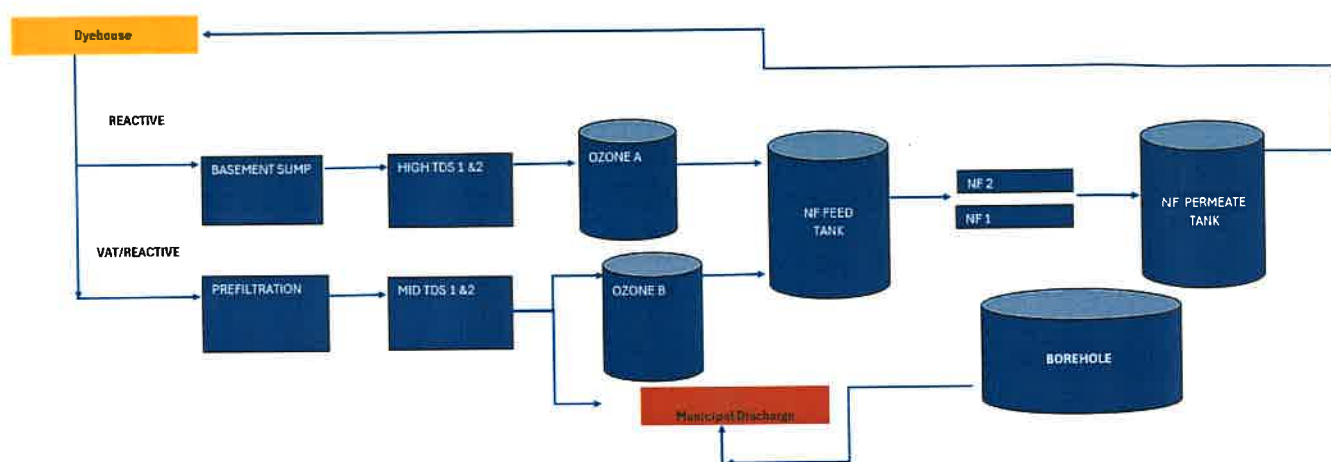
- Operation and operator training
- Babysitting
- Performance test approx. 1 month after start-up

3. Technical Information

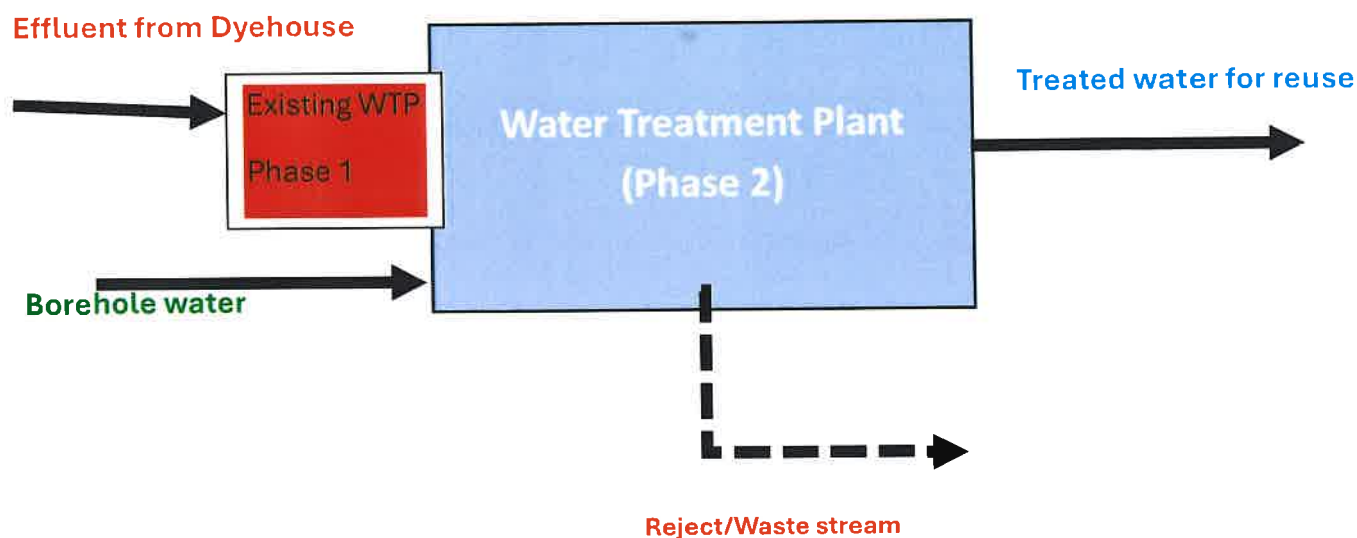
ETP Capacity

Required ETP capacity to process up to 1.2 ML/day of effluent, with a possible instantaneous surge of up to 120 kl per hour (for a period of possibly 8 to 10 minutes) to reclaim at least 85% for reuse as softened feedwater to the dyehouse. Current average use of softened feedwater is 800 kl per 24-hour period on days of operation.

Process Flow of Current Effluent Treatment Plant



Integration of Phase 2 Water Treatment Plant for Effluent Reuse



Required Output of New ETP

We provide the following information in order to establish whether your company is interested and able to provide a technically suitable solution for our requirements.

Water specification for feed water to dyehouse:

Parameter	Specification
Hardness Calcium Carbonate (CaCO ₃)	Max 0.8 mg/l (8ppm)
Calcium (Ca)	Max 0.4 mg/l
Magnesium (Mg)	max 0.4 mg/l
Copper (Cu)	max 0.01 ppm
Manganese (Mn)	max 0.02 ppm
Iron (Fe)	Max 0.02 mg/l
pH range	6.5 to 7.5
Salts	Nil
Suspended solids	Nil
Active Chlorine	Nil

Disposal of Reject Concentrate

Propose an existing or integrated solution for the responsible disposal / reuse / reclamation of reject concentrate and sludge.

Attachments:

- Effluent and Borehole water test results.
- Current ETP process flow diagram (as given by original installer)
- Current ETP layout diagram (as given by original installer)
- P&ID existing ETP
- Layout Diagram Ozone Treatment Plant
- Layout Diagram Dyehouse

Examples of textile processing chemicals that may be present in the raw dyehouse effluent:

- Cotton fibres (and possible small amounts of polyester fibres)
- PVA
- Starch (potato)
- Reactive dyes
- Vat dyes
- Sodium hydrosulphite
- Disperse dyes
- Dispersing agents
- Optical Brightening Agents*

- Caustic Soda
- Acid
- Sodium bicarbonate
- Common Salt
- Sodium sulphate (Glauber's salt)
- Sizing chemicals (PVA, Starch, CMC)
- Levelling agents
- Soda ash
- Softeners
- Anti-microbial (silver, but could vary in the future)
- Anti-fungal
- Spin finish
- Waxes
- Surfactants
- Anti-foam
- Enzymes
- Foam

General information on the Textile Factory and Dyehouse

- The dyehouse has 12 fabric jet-dyeing (exhaust) machines and 3 yarn dyeing machines, with a total liquor capacity across all machines of 30 422L when filled to capacity.
- The dyeing is a batch process.
- Most dye baths (vat and reactive dyeing of cotton) and bleaching will have a high (alkaline) pH, often above pH12. Occasionally, disperse dyes are dyed and have a low pH (+-pH4-5.5).
- Dye exhaustion is typically higher in vat and disperse dyelots than in reactive dyelots, thus there may be a higher colour load on dark reactive shades than equivalent other batches.
- Common salt (NaCl) and Glauber's salt (NaSO₄) or sodium sulphate, are both used in the dyeing process, increasing conductivity.
- Sizing trough drains (once per day) and preparation baths (every first drain on woven fabric dyeing) are likely to contain PVA and starch, as well as waxes.
- Rinse baths (after the dyeing process) often have a colour component and will contain dyeing chemicals but tend to be less concentrated in terms of chemicals and are closer to neutral pH. There can be up to 18 rinse baths per dyebatch.
- Finishes include silicone softeners and antimicrobial finishes.



ANNEXURE 1

Intent to Submit and Expression of Interest

I, ... (name) holding to position of
.....

hereby confirm on behalf of (company)

Contact details:

Address:

Telephone number:

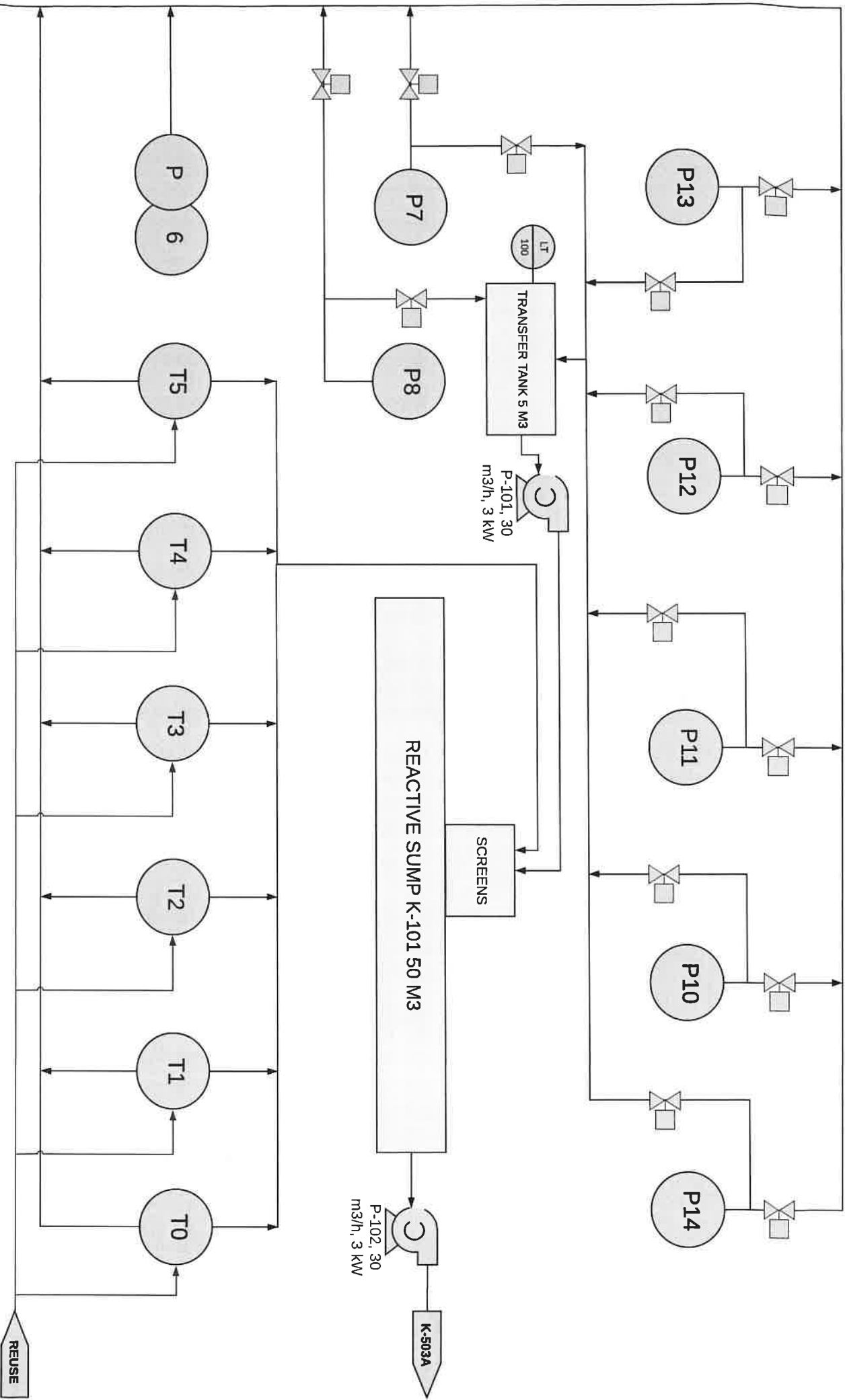
Email address:

that we **will / will not** (indicate relevant response)

submit an **Expression of Interest** by (date) with respect to
providing a **high-level proposal** for the planned expansion of the effluent and
borehole water treatment plant at Glodina Towelling (Pty) Ltd, Hammarsdale,
Kwa-Zulu Natal, South Africa.

Signed:

Date:



MAIN DRAIN

PROJECT: 2023016 - GLODINA BRINE INTEGRATION			
TITLE: DYEHOUSE LAYOUT			
DRAWING: 2018088-INTEGRATION-LAYOUT-01-KS			
DRAWN	NAME	DATE	
K. SUMADRAJI		2023/04/28	

Effluent and Borehole Water Test Results 2026.07

Sample	Test	Units	Result
1: Size trough drain 28.07.2026 DS REF 019341/26	3 Chemical Oxygen Demand (Total) mg O ₂ /ℓ	mg O ₂ /ℓ	62597
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	995
	2A Electrical Conductivity at 25°C	mS/m	31
	1 pH at 25°C	pH Units	5.1
	124 Settleable Solids*	mℓ/ℓ	<1
	Starch Content*		Absent
	5 Suspended Solids at 105°C		17120

Sample	Test	Units	Result
2: Scour desize bleach 1st drain 28.07.2026 NS REF 019342/26	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	7155
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	387
	2A Electrical Conductivity at 25°C	mS/m	2017
	1 pH at 25°C	pH Units	12.7
	124 Settleable Solids*	mℓ/ℓ	NR
	Starch Content*		Absent
	5 Suspended Solids at 105°C	mg/ℓ	NR

Sample	Test	Units	Result
3: DARK VAT 1ST DRAIN THIES 29.07.2026 REF 019344/26	233-2 Dissolved Calcium	mg Ca/ℓ	15
	233-2 Dissolved Potassium	mg K/ℓ	16.1
	233-2 Dissolved Magnesium	mg Mg/ℓ	8.48
	233-2 Dissolved Sodium	mg Na/ℓ	10131
	234-1 Total Iron	µg Fe/ℓ	2852
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	8341
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	725
	40A Colour (True)	mg Pt-Co/ℓ	8600
	40A Colour (Apparent)	mg Pt-Co/ℓ	20900
	Electrical Conductivity*	mS/m	3036
	200 pH @ 25°C*	pH units	12.1
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	320

Sample	Test	Units	Result
4: VAT DRAIN ANTIMICROBIAL & Si SOFTENER BATH 29.07.2026 REF 019354/26	234-1 Dissolved Silver	µg Ag/ℓ	<5
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	183
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	38
	2A Electrical Conductivity at 25°C	mS/m	35
	1 pH at 25°C	pH units	6.1
	233-1 Dissolved Silicon*	mg Si/ℓ	3.33

Sample	Test	Units	Result
5: MED DISPERSE DYE 1ST DRAIN THIES 4 29.07.2026 REF 019345/26	233-2 Dissolved Calcium	mg Ca/ℓ	13.7
	233-2 Dissolved Potassium	mg K/ℓ	18
	233-2 Dissolved Magnesium	mg Mg/ℓ	16.3
	233-2 Dissolved Sodium	mg Na/ℓ	134
	234-1 Total Iron	µg Fe/ℓ	532
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	1626
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	89
	40A Colour (True)	mg Pt-Co/ℓ	123
	40A Colour (Apparent)	mg Pt-Co/ℓ	906
	2A Electrical Conductivity at 25°C	mS/m	61
	1 pH at 25°C	pH units	4
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	<18

Sample	Test	Units	Result
6: DARK REACTIVE 1ST DRAIN DYE BATH THIES 1 29.07.2026 019346/26	233-2 Dissolved Calcium	mg Ca/ℓ	0.69
	233-2 Dissolved Potassium	mg K/ℓ	285
	233-2 Dissolved Magnesium	mg Mg/ℓ	8.62
	233-2 Dissolved Sodium	mg Na/ℓ	466
	234-1 Total Iron	µg Fe/ℓ	555
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	2385
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	139
	40A Colour (True)	mg Pt-Co/ℓ	35800
	40A Colour (Apparent)	mg Pt-Co/ℓ	38900
	Electrical Conductivity*	mS/m	4668
	200 pH @ 25°C*	pH units	10.3
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	278

Sample	Test	Units	Result
7: BLEACH OBA 1ST DRAIN OBA BATH THIES 3 29.07.2026 REF 019347/26	233-2 Dissolved Calcium	mg Ca/ℓ	45
	233-2 Dissolved Potassium	mg K/ℓ	574
	233-2 Dissolved Magnesium	mg Mg/ℓ	22
	233-2 Dissolved Sodium	mg Na/ℓ	3611
	234-1 Total Iron	µg Fe/ℓ	292
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	6576
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	169
	40A Colour (True)	mg Pt-Co/ℓ	365
	40A Colour (Apparent)	mg Pt-Co/ℓ	1030
	2A Electrical Conductivity at 25°C	mS/m	2138
	1 pH at 25°C	pH units	12.7
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	76

Sample	Test	Units	Result
8: VAT SUMP AT ETP 14:05 29.07.2026 REF 019349/26	233-2 Dissolved Calcium	mg Ca/ℓ	14.2
	233-2 Dissolved Potassium	mg K/ℓ	194
	233-2 Dissolved Magnesium	mg Mg/ℓ	12.8
	233-2 Dissolved Sodium	mg Na/ℓ	2135
	234-1 Total Iron	µg Fe/ℓ	332
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	3570
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	94
	40A Colour (True)	mg Pt-Co/ℓ	1020
	40A Colour (Apparent)	mg Pt-Co/ℓ	1480
	Electrical Conductivity*	mS/m	800
	200 pH @ 25°C*	pH units	11
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	41

Sample	Test	Units	Result
9: REACTIVE SUMP AT ETP 14:15 29.07.2026 REF 019348/26	233-2 Dissolved Calcium	mg Ca/ℓ	5.64
	233-2 Dissolved Potassium	mg K/ℓ	66
	233-2 Dissolved Magnesium	mg Mg/ℓ	4.56
	233-2 Dissolved Sodium	mg Na/ℓ	1626
	234-1 Total Iron	µg Fe/ℓ	161
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	717
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	190
	40A Colour (True)	mg Pt-Co/ℓ	284
	40A Colour (Apparent)	mg Pt-Co/ℓ	769
	2A Electrical Conductivity at 25°C	mS/m	632
	1 pH at 25°C	pH units	10.1
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	33

Sample	Test	Units	Result
10: BOREHOLE WATER 14:02 29.07.2026 REF 019343/26	233-2 Dissolved Calcium	mg Ca/ℓ	73
	233-2 Dissolved Magnesium	mg Mg/ℓ	18.7
	233-2 Dissolved Sodium	mg Na/ℓ	56
	234-1 Acid Soluble Copper	µg Cu/ℓ	<10
	234-1 Acid Soluble Iron	µg Fe/ℓ	<10
	234-1 Acid Soluble Manganese	µg Mn/ℓ	<5
	234-1 Acid Soluble Lead	µg Pb/ℓ	<10
	10G3 Total Alkalinity	mg CaCO ₃ /ℓ	261
	16G3 Chloride	mg Cl/ℓ	28
	122 Free Chlorine*	mg Cl ₂ /ℓ	<0.1
	40A Colour (True)	mg Pt-Co/ℓ	<10
	2A Electrical Conductivity at 25°C	mS/m	63
	18G3 Fluoride	mg F/ℓ	0.26
	65Gc3 Nitrate	mg N/ℓ	<0.5
	65Gb3 Nitrite	mg N/ℓ	<0.25
	Calc. Combined Nitrate + Nitrite (sum of Ratios)	mg N/ℓ	<0.32
	4 Turbidity	NTU	0.6
	1 pH at 25°C	pH units	8.2
	67G3 Sulphate	mg SO ₄ /ℓ	147
	Calc. Total Hardness	mg CaCO ₃ /ℓ	261

Sample	Test	Units	Result
11: OZONE PROCESSED REACTIVE 29.07.2026 019958/26 REF 019958/26	233-2 Dissolved Calcium	mg Ca/ℓ	6.63
	233-2 Dissolved Potassium	mg K/ℓ	82
	233-2 Dissolved Magnesium	mg Mg/ℓ	5.9
	233-2 Dissolved Sodium	mg Na/ℓ	3225
	234-1 Total Iron	µg Fe/ℓ	225
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	716
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	93
	40A Colour (True)	mg Pt-Co/ℓ	122
	40A Colour (Apparent)	mg Pt-Co/ℓ	885
	2A Electrical Conductivity at 25°C	mS/m	1335
	1 pH at 25°C	pH units	9.7
	124 Settleable Solids*	mℓ/ℓ	<1
	Starch Content*		Absent
	5 Suspended Solids at 105°C	mg/ℓ	86

Sample	Test	Units	Result
12: FINAL ETP DISCHARGE 14:25 29.07.2026 019350/26 REF 019350/26	233-2 Dissolved Calcium	mg Ca/ℓ	12.5
	233-2 Dissolved Potassium	mg K/ℓ	149
	233-2 Dissolved Magnesium	mg Mg/ℓ	12.5
	233-2 Dissolved Sodium	mg Na/ℓ	1693
	234-1 Total Iron	µg Fe/ℓ	336
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	2126
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	86
	40A Colour (True)	mg Pt-Co/ℓ	885
	40A Colour (Apparent)	mg Pt-Co/ℓ	1350
	Electrical Conductivity*	mS/m	514
	200 pH @ 25°C*	pH units	10.1
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	29

1. Size padder drain
2. Scour / desize / bleach first drain
3. Vat dye first drain – dark shade on sample machine
4. Vat dye last drain - sample machine including anti-microbial finish & softener
5. Disperse dye first drain
6. Reactive dye first drain – dark shade
7. Bleach first drain with OBA
8. Vat sump at ETP
9. Reactive sump at ETP
10. Borehole water
11. Ozone treated reactive sump effluent (8 hours)
12. ETP discharge effluent to municipality (sample 2)

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	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	995
	2A Electrical Conductivity at 25°C	mS/m	31
	1 pH at 25°C	pH Units	5.1
	124 Settleable Solids*	mℓ/ℓ	<1
	Starch Content*		Absent
	5 Suspended Solids at 105°C		17120

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	2A Electrical Conductivity at 25°C	mS/m	2017
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	Starch Content*		Absent
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	40A Colour (True)	mg Pt-Co/ℓ	8600
	40A Colour (Apparent)	mg Pt-Co/ℓ	20900
	Electrical Conductivity*	mS/m	3036
	200 pH @ 25°C*	pH units	12.1
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	320

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	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	2385
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	40A Colour (True)	mg Pt-Co/ℓ	35800
	40A Colour (Apparent)	mg Pt-Co/ℓ	38900
	Electrical Conductivity*	mS/m	4668
	200 pH @ 25°C*	pH units	10.3
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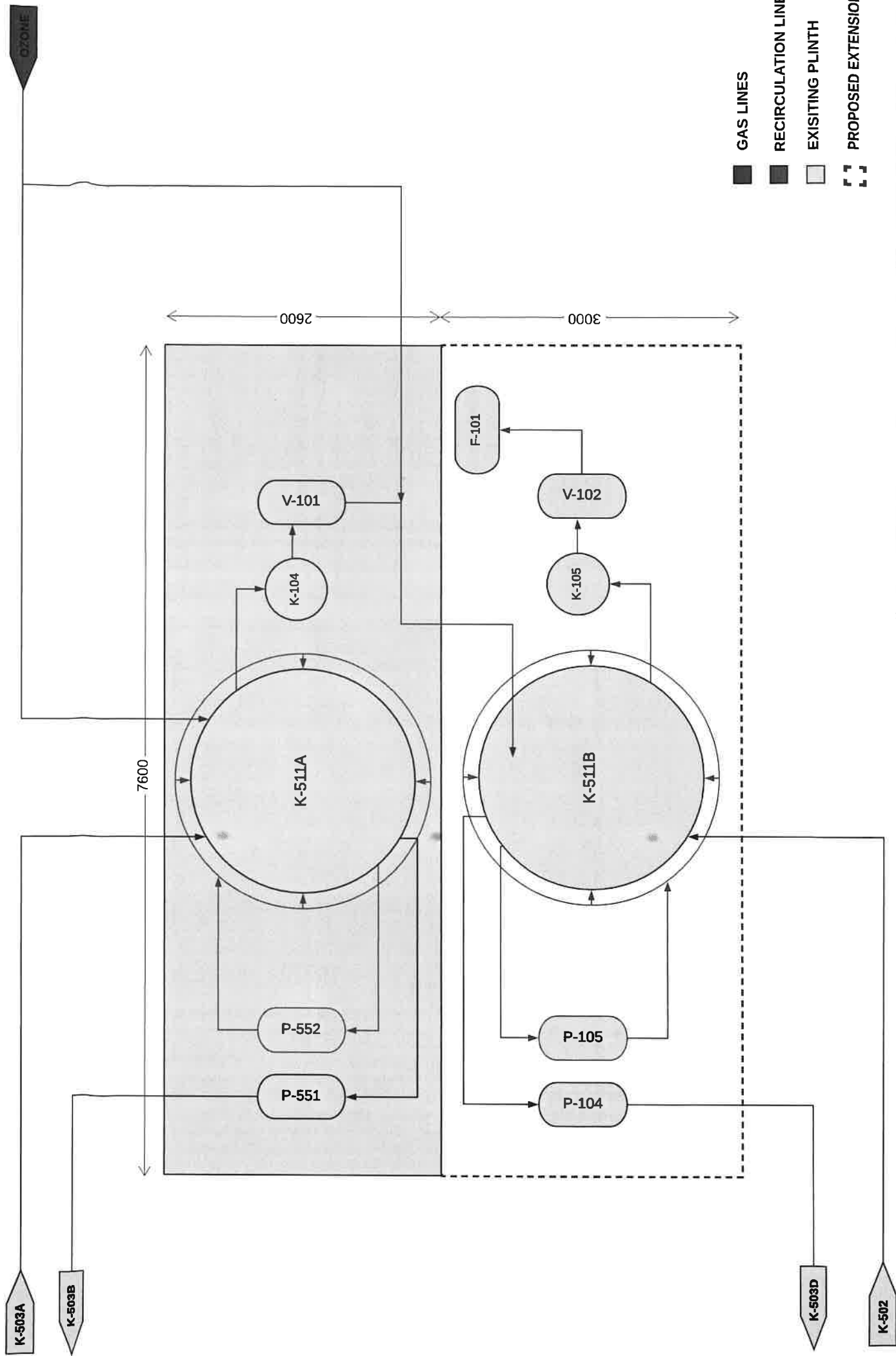
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	16G3 Chloride	mg Cl/ℓ	28
	122 Free Chlorine*	mg Cl ₂ /ℓ	<0.1
	40A Colour (True)	mg Pt-Co/ℓ	<10
	2A Electrical Conductivity at 25°C	mS/m	63
	18G3 Fluoride	mg F/ℓ	0.26
	65Gc3 Nitrate	mg N/ℓ	<0.5
	65Gb3 Nitrite	mg N/ℓ	<0.25
	Calc. Combined Nitrate + Nitrite (sum of Ratios)	mg N/ℓ	<0.32
	4 Turbidity	NTU	0.6
	1 pH at 25°C	pH units	8.2
	67G3 Sulphate	mg SO ₄ /ℓ	147
	Calc. Total Hardness	mg CaCO ₃ /ℓ	261

Sample	Test	Units	Result
11: OZONE PROCESSED REACTIVE 29.07.2026 019958/26 REF 019958/26	233-2 Dissolved Calcium	mg Ca/ℓ	6.63
	233-2 Dissolved Potassium	mg K/ℓ	82
	233-2 Dissolved Magnesium	mg Mg/ℓ	5.9
	233-2 Dissolved Sodium	mg Na/ℓ	3225
	234-1 Total Iron	µg Fe/ℓ	225
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	716
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	93
	40A Colour (True)	mg Pt-Co/ℓ	122
	40A Colour (Apparent)	mg Pt-Co/ℓ	885
	2A Electrical Conductivity at 25°C	mS/m	1335
	1 pH at 25°C	pH units	9.7
	124 Settleable Solids*	mℓ/ℓ	<1
	Starch Content*		Absent
	5 Suspended Solids at 105°C	mg/ℓ	86

Sample	Test	Units	Result
12: FINAL ETP DISCHARGE 14:25 29.07.2026 019350/26 REF 019350/26	233-2 Dissolved Calcium	mg Ca/ℓ	12.5
	233-2 Dissolved Potassium	mg K/ℓ	149
	233-2 Dissolved Magnesium	mg Mg/ℓ	12.5
	233-2 Dissolved Sodium	mg Na/ℓ	1693
	234-1 Total Iron	µg Fe/ℓ	336
	3 Chemical Oxygen Demand (Total)	mg O ₂ /ℓ	2126
	156 Biochemical Oxygen Demand (5-Day BOD)*	mg O ₂ /ℓ	86
	40A Colour (True)	mg Pt-Co/ℓ	885
	40A Colour (Apparent)	mg Pt-Co/ℓ	1350
	Electrical Conductivity*	mS/m	514
	200 pH @ 25°C*	pH units	10.1
	124 Settleable Solids*	mℓ/ℓ	<1
	5 Suspended Solids at 105°C	mg/ℓ	29

1. Size padder drain
2. Scour / desize / bleach first drain
3. Vat dye first drain – dark shade on sample machine
4. Vat dye last drain - sample machine including anti-microbial finish & softener
5. Disperse dye first drain
6. Reactive dye first drain – dark shade
7. Bleach first drain with OBA
8. Vat sump at ETP
9. Reactive sump at ETP
10. Borehole water
11. Ozone treated reactive sump effluent (8 hours)
12. ETP discharge effluent to municipality (sample 2)



PROJECT: 2023016 - GLODINA BRINE INTEGRATION			
TITLE: Ozone Plinth Layout			
DRAWING: 2023016-Ozone-Plinth-Layout-01-KS			
DRAWN	NAME	DATE	
	K. SUMADRAJI	2023/04/28	

