GLS ALUMINIUM INDUSTRIES PVT. LTD.

REWARI UNIT, HARYANA

WATER MANAGEMENT STUDY

Flow Assessment | Operational Validation | Water Stewardship & ASI Principle 7

Issue	1
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Document Control

Control Item	Detail
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Client / Facility	GLS Aluminium Industries Pvt. Ltd. - Rewari Unit, Haryana
Issue	1
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Basis of Study	Current Water Complex Flow Diagram, site utility confirmations, installed flow-meter arrangement, sample WTP/ETP/STP operating log sheets, 2024 water-use and production KPI data, three-site rainwater recharge wells, and management information supplied for ASI Principle 7 alignment.
Reference Frameworks	ASI Performance Standard V3.1 - Principle 7 (Water Stewardship); GRI 303: Water and Effluents (2018); Alliance for Water Stewardship principles referenced for long-term stewardship.
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Executive Summary

GLS Aluminium Industries Pvt. Ltd. operates a structured water system covering canal-water intake, storage, filtration, softening, reverse osmosis, process cooling, drinking and sanitary supply, effluent treatment, sewage treatment and non-potable reuse. The current flow diagram shows the principal water routes from source to use, treatment and reuse.

The process-cooling system is arranged as four closed-loop cooling-water trains. Fresh make-up replaces evaporation, drift and controlled blow-down rather than the full circulating flow. Cooling-tower blow-down, RO reject and softener backwash are routed to the ETP. STP-treated water is used for gardening and ETP-treated water is used for floor cleaning.

Five important flow meters are available for routine water accounting: canal intake, process-water make-up, drinking water, ETP-treated water and STP-treated water. Operators maintain WTP, ETP and STP log sheets with operating readings, flows, tank levels, dosing information and daily/to-date quantities. These records provide the operating evidence needed for monthly water-balance reporting, reuse accounting and water-intensity tracking.

The capacity check in this report is positive for the soft-water and drinking-water chains. These calculations are engineering capacity checks only; they are not a substitute for actual monthly water use. Actual reporting should be based on totalised flow-meter readings, treatment-plant logs and production data.

Sample WTP operating records also show strong RO salt-removal performance at the recorded times. Two clearly readable paired readings show feed TDS of 2,800 and 2,470 ppm against permeate/UV TDS of 120 and 130 ppm, corresponding to approximately 95.7% and 94.7% TDS reduction. These are operator log readings and should be treated as process-control evidence rather than independent laboratory certificates.

Water performance is managed through a monthly KPI. The 2024 water-use figure provided is 14,620 KL against 9,162 tonnes of production, equivalent to 1.596 KL/tonne (approximately 1.60 KL/tonne when rounded to two decimals). The management target is to achieve 1.25 KL/tonne by the end of 2026, representing an improvement of approximately 21.7% from the calculated 2024 baseline. Engineering and EHS are responsible for monthly monitoring. The KPI supports SDG 6 and SDG 12.

Three rainwater recharge wells are available at the site. Collected rainwater is directed to these wells for local recharge. The water-risk assessment in this study identifies source continuity, seasonal variability, source-water quality, treatment efficiency, cooling-water demand, leakage/overflow, treated-water quality, target achievement and stakeholder/shared-water considerations as the principal water-related risks to be managed.

Water stewardship information is included in the company's public disclosure process. The public information should be maintained annually and should present water withdrawal and

use by source/type, water-intensity performance, principal water-related risks, reuse/recharge measures, targets and progress.

Area	Current Position
Water source	Canal water, with intake metering.
Primary storage	Raw-water, fire-water, treated-water, RO and soft-water tanks are identified in the system.
Cooling water	Four closed-loop trains with dedicated sump/circulation arrangement and shared make-up.
Wastewater treatment	ETP receives identified industrial wastewater streams; STP treats sanitary wastewater.
Reuse	ETP-treated water for floor cleaning; STP-treated water for gardening.
Operational records	WTP, ETP and STP log sheets are being maintained by operators.
Water accounting	Five key flow meters support routine monthly balance preparation.
Water KPI	2024 calculated intensity: 1.596 KL/tonne (about 1.60); target 1.25 KL/tonne by end-2026; monitored monthly by Engineering / EHS.
Rainwater recharge	Three recharge wells are in place and receive collected rainwater for local recharge.
Water risk management	Site-level water risks are assessed and linked to controls, monitoring and review actions.
Public disclosure	Water stewardship information is included in the public disclosure process and is to be updated at least annually.

1. Introduction and Objective

The purpose of this study is to present the GLS water system in one controlled, understandable report and to provide a practical basis for water accounting, efficiency improvement and future water-stewardship reporting.

The study objectives are to:

Map the water route from intake through treatment, storage, distribution, use, wastewater treatment and reuse.

Check the major system capacities and confirm that the principal water routes are logically consistent.

Validate the availability of operational records and flow-meter information for routine water accounting.

Identify practical efficiency, reuse and monitoring measures without overstating rated pump capacities as actual consumption.

Provide a measurable water-stewardship programme covering water intensity, risk management, stakeholder engagement, reuse, recharge, public disclosure and long-term water neutrality.

2. Basis and Evidence Reviewed

This report is based on the documents and photographic evidence made available for the study. The assessment is therefore limited to the information shown in those records and the system information confirmed by the site utilities team.

Evidence	Use in This Study
Water Complex Flow Diagram	Used to map water source, tanks, pumps, treatment units, closed-loop cooling, ETP/STP routes and reuse points.
WTP operating log sheets	Used to confirm routine recording of RO feed/permeate quality, pressures, flows, tank levels and daily water totals.
ETP operating log sheet	Used to confirm routine recording of tank levels, pH, flow indication, chemical dosing, electrical meter and treated-water quantities.
STP operating log sheet	Used to confirm routine recording of pump operating status, run time, chemical dosing, waste generation and treated-water flow.
Site utility confirmation	Used for the water routes and equipment arrangement described in this report.
Water KPI / recharge / management information	Used to establish the 2024 water-intensity baseline, 2026 target, three rainwater recharge wells, water-risk controls, stakeholder

Evidence	Use in This Study
	engagement framework and public-disclosure arrangements.

Validation note

Operator log sheets are process-control records. Where a statutory or consent parameter requires accredited laboratory testing, the laboratory report remains the compliance evidence. The operating logs complement, but do not replace, such laboratory reports.

3. Water Complex - System Description

3.1 Water Source, Storage and Treatment

Item	Capacity / Flow	Configuration	Function
Canal intake	-	-	Primary raw-water source; intake is metered.
Raw Water Tank-1	200 KL	-	Raw-water storage ahead of the pump house.
Fire Tank	400 KL	-	Dedicated fire-water reserve.
Softener Water Plant Pump 1,2	30 m^3/hr	1W+1S	Feeds the Soft Water Tank.
MGF & ACF Feed Pump 1,2	30 m^3/hr	1W+1S	Feeds MGF/ACF treated-water tank for RO.
MGF & ACF Treated Water Tank for RO	200 KL	-	Buffer storage ahead of RO.
RO Plant	5 KL/hr	-	Produces RO permeate for drinking/sanitary supply.
RO Tank	200 KL	-	RO water storage.
Soft Water Tank	200 KL	-	Buffer storage for cooling-water make-up and identified utility use.

3.2 Fire-Water System

Pump	Flow	Head	Configuration
Jockey Pump	10.8 m^3/hr	70 m	2W

Pump	Flow	Head	Configuration
Sprinkler Pump	171 m^3/hr	70 m	1W
Fire Hydrant Main Pump	171 m^3/hr	70 m	1W
Diesel Pump (standby)	171 m^3/hr	70 m	1W

3.3 Distribution, Process Cooling and End Uses

Item	Flow / Capacity	Configuration	Destination / Use
Make-up Pump 1,2	10 m^3/hr	1W+1S	Process-water flow meter to closed-loop cooling system.
Cooling Tower Sump Tanks x4	10 KL each (40 KL total)	30 m^3/hr pumps	Feeds corresponding circulation tanks.
Circulation Tanks x4	6 KL each (24 KL total)	200 m^3/hr, 1W+2S each	Supplies principal process cooling users and returns water through the closed loop.
Drinking Water Pump 1,2	4.7 m^3/hr	1W+1S	Canteen, drinking and toilet water supply through the drinking-water meter.
AHU Bay Ventilation 1-5	75,000 CFM each (air side)	-	Utility water source identified as the Soft Water Tank; water-side quantity is accounted through operating records as available.

3.4 Wastewater Treatment and Reuse

Stream	Source	Treatment / Route	Reuse / Final Use
Sanitary wastewater	Toilets	STP -> STP treated-water meter	Gardening
Roll-grinder wastewater	Work Roll Grinder	ETP -> ETP treated-water meter -> Treated Water Tank	Floor-cleaning system
RO reject / concentrate	RO system	Common waste header -> ETP	Treated through ETP route
Cooling-tower blow-down	Cooling-water system	Common waste header -> ETP	Treated through ETP route

Stream	Source	Treatment / Route	Reuse / Final Use
Softener regeneration / backwash	Softener system	ETP	Treated through ETP route
ETP-treated water	ETP	Treated Water Tank	Floor cleaning
STP-treated water	STP	Treated-water line	Gardening

3.5 Water Complex Flow Diagram

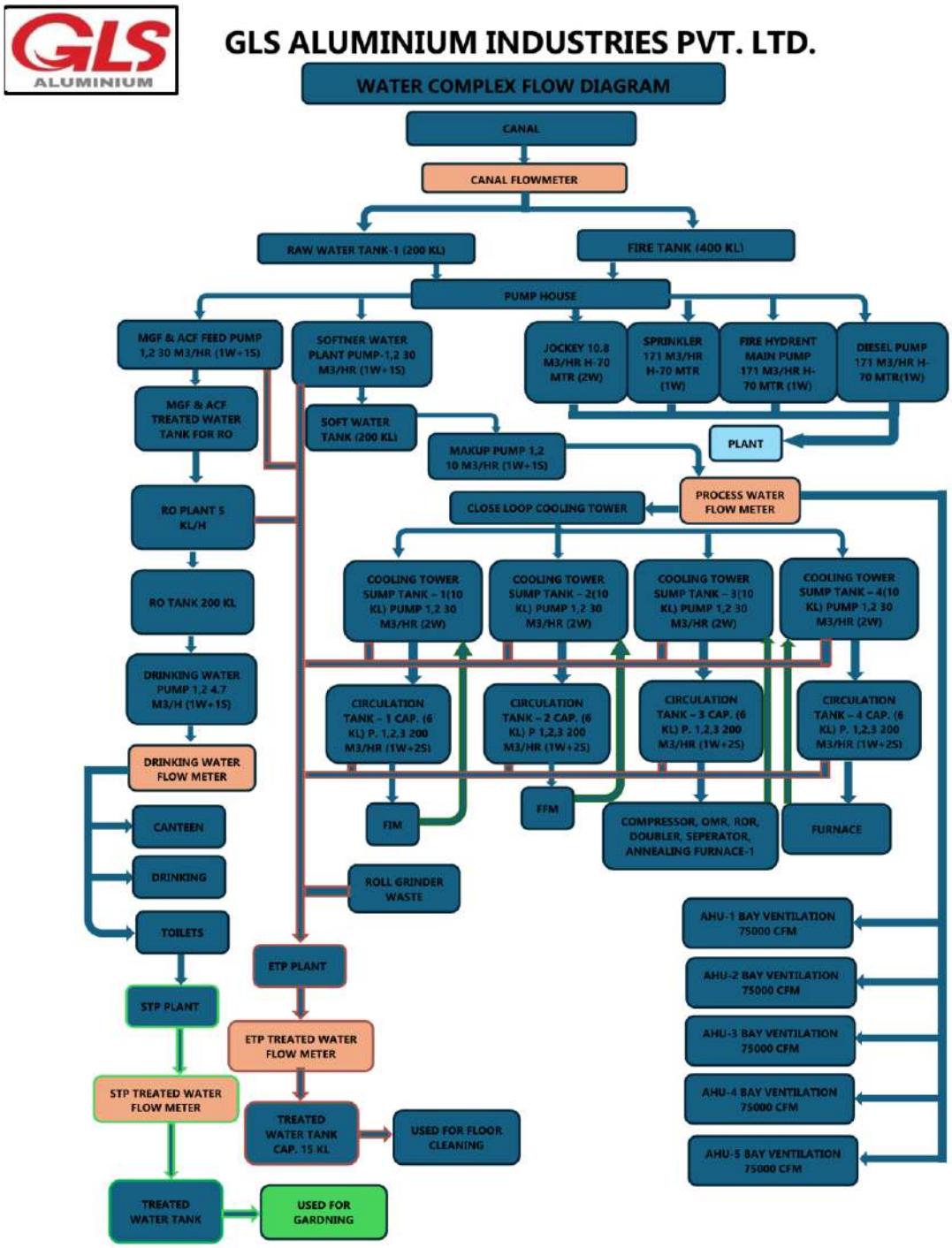


Figure 1. Water Complex Flow Diagram provided for the GLS water-management study.

4. Water Balance Assessment

4.1 Water-Balance Principle

A water balance should be prepared for a defined reporting period, normally monthly and annually. The basic check is: total intake = consumption + discharge + change in storage, after

accounting for recycled and reused water. The five installed meters provide the core measurements needed to move from equipment ratings to actual water quantities.

Water Stream	Classification	Reporting Treatment
Cooling-water circulation	Recirculated / non-consumptive	Do not count the full internal circulation as fresh-water use. Count make-up and losses.
Cooling-tower evaporation and drift	Consumptive	Estimate or determine from make-up, blow-down and operating data.
Cooling-tower blow-down	Discharge to treatment	Record as ETP-bound water.
Drinking / canteen / sanitary water	Consumptive with sanitary return	Record drinking-water meter total; STP output represents the recovered sanitary portion.
STP-treated water	Recycled / reused	Record reuse for gardening.
ETP-treated water	Recycled / reused	Record reuse for floor cleaning.
RO reject	ETP-bound discharge	Record as part of the RO water balance when a dedicated reading is available.

4.2 Rated-Capacity Check

Sub-system	Rated Water In	Rated Demand / Condition	Capacity Check
Soft-water chain	30 m^3/hr	10 m^3/hr make-up demand	+20 m^3/hr capacity margin
RO / drinking-water chain	5 m^3/hr RO throughput	4.7 m^3/hr combined demand	+0.3 m^3/hr capacity margin
Cooling-water circuit	10 m^3/hr shared make-up	Closed-loop internal circulation	Make-up replaces losses; internal circulation is not fresh-water demand
Overall branch capacity check	60 m^3/hr combined rated upstream pump capacity	14.7 m^3/hr identified make-up + drinking demand	Positive engineering capacity margin

Important interpretation

This table is a capacity check, not a consumption statement. Pumps do not necessarily operate continuously or at full rated flow. Actual water use must be calculated from meter totals and operating hours.

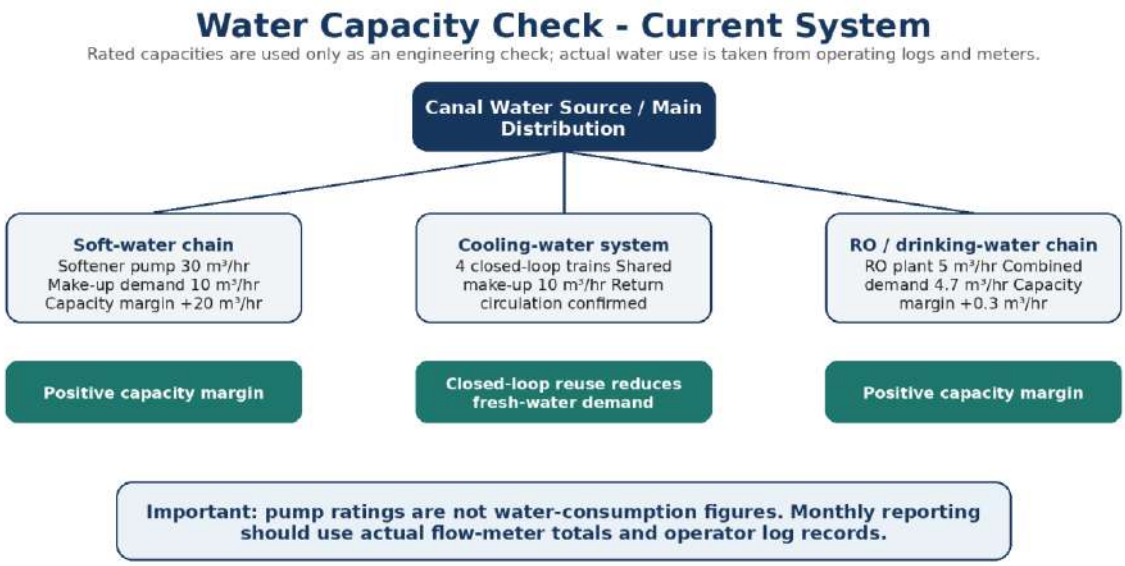


Figure 2. Engineering capacity check for the main water chains.

4.3 24-Hour Rated-Capacity Equivalent

Stage	Rated Flow	24-hour Equivalent
Softener Water Plant Pump	30 m^3/hr	720 KL/day
MGF & ACF Feed Pump	30 m^3/hr	720 KL/day
Soft-water make-up demand	10 m^3/hr	240 KL/day
RO Plant throughput	5 m^3/hr	120 KL/day
Combined drinking/sanitary demand pump	4.7 m^3/hr	112.8 KL/day
Combined upstream rated pump capacity	60 m^3/hr	1,440 KL/day
Identified make-up + drinking rated demand	14.7 m^3/hr	352.8 KL/day

These figures show only the maximum daily equivalent if each item operated continuously for 24 hours at its stated rate. They are useful for engineering scale checks but should not be used as reported daily consumption.

5. Operational Validation and Observation

The operating records supplied with this study were reviewed to confirm whether the water-treatment systems are being monitored in day-to-day operation.

Observation No.	Observation	Evidence	Management Use
O-01	Operators are maintaining WTP, ETP and STP operating log sheets.	The photographed records contain time-based operating readings, tank levels, flow information, chemical-dosing entries, daily/to-date quantities and operator/in-charge signatures.	Continue the log-sheet practice and use the recorded totals as the primary source for monthly water-balance preparation and trend review.

5.1 WTP Log Interpretation

The WTP log sheet records RO feed quality, membrane/filter pressures, feed/permeate/reject flows, permeate quality, UV quality, tank levels and daily water totals. This is useful for both process control and water-accounting verification.

Recorded Time	RO Feed TDS (ppm)	RO Permeate / UV TDS (ppm)	Approx. TDS Reduction	RO Feed Flow (m^3/hr)	RO Permeate Flow (m^3/hr)	Apparent Recovery
08:30	2,800	120	95.7%	6.0	3.61	60.2%
10:30	2,470	130	94.7%	6.1	3.72	61.0%

The sample readings indicate strong dissolved-salt reduction across the RO system at the recorded times. The recovery percentages above are simple permeate-flow divided by feed-flow calculations from the visible log entries. They are indicative operating checks and should be confirmed through consistent totalised meter data when preparing the monthly water balance.

5.2 ETP and STP Log Interpretation

The ETP log records tank levels, pH, flow indication, chemical dosing, electrical-meter information and treated-water quantities. The sample pH readings visible in the record are around 7.6-7.7, demonstrating that pH is being checked during operation. The STP log records pump selection, automatic/manual mode, start/stop time, chemical dosing, waste generation and treated-water flow. Together, these records demonstrate routine operator control of the treatment plants.

Use of these records

A monthly management review should summarise canal intake, process-water make-up, drinking-water use, ETP-treated water, STP-treated water, production quantity and calculated water intensity. This converts daily operator entries into a management KPI without adding unnecessary paperwork.

6. Metering and Monitoring Framework

6.1 Installed Core Meters

Meter	Purpose in Water Balance	Recommended Review
Canal intake	Total fresh-water withdrawal	Daily reading; monthly total
Process water / cooling make-up	Fresh make-up to closed-loop cooling system	Daily reading; monthly total
Drinking water	Canteen + drinking + sanitary supply	Daily reading; monthly total
ETP treated water	Industrial treated-water output / reuse	Daily reading; monthly total
STP treated water	Sanitary treated-water output / reuse	Daily reading; monthly total

Operators are already maintaining log sheets. The main control required is consistency: record opening and closing totaliser readings, calculate daily quantity, obtain operator sign-off, and perform a supervisor review at a defined frequency.

6.2 Optional Sub-Metering for Better Process Detail

Optional Point	Reason
RO feed	Allows direct RO feed accounting and recovery calculation.
RO permeate	Allows direct comparison of product water against feed.
RO reject	Separates RO reject from other ETP-bound streams.
Softener backwash	Quantifies intermittent regeneration/backwash volume.
Large process users	Helps identify high-consumption equipment and supports efficiency projects.

These meters are improvement options. They are not required to demonstrate that operators are maintaining the current logs, but they can improve future process-level water accounting.

7. Water Stewardship, Risk, KPI and Reuse Programme

7.1 Closed-Loop Cooling

The four cooling-water trains recirculate water through sump and circulation tanks. Fresh make-up should be managed against evaporation, drift and blow-down rather than against the full circulation rate.

7.2 Treated-Water Reuse

ETP-treated water is used for floor cleaning and STP-treated water is used for gardening. Monthly reuse quantities should be recorded so that the reuse rate can be reported as a percentage of fresh-water intake.

7.3 RO System Efficiency

RO feed, permeate and reject readings should be trended together. Salt rejection, recovery, pressure and TDS trends can indicate membrane fouling, scaling or changes in feed-water quality.

7.4 Leak and Overflow Control

Routine walk-downs should check taps, hose points, visible pipelines, valves, tank overflows and drains. Correcting visible losses is normally the fastest water-saving action.

7.5 Cooling-Tower Optimisation

Cycles of concentration, make-up, blow-down and conductivity should be reviewed together. Optimising blow-down while protecting water chemistry can reduce fresh-water demand.

7.6 Water Performance KPI and Target

Water intensity is the primary site-level water-efficiency KPI. The KPI is calculated as total fresh-water use for the reporting period divided by tonnes of aluminium foil production for the same period. The KPI shall be reviewed monthly using meter totals and production data. For controlled reporting, the same boundary and units shall be used consistently from month to month.

KPI	Baseline / Current Position	Frequency	Target	Owner	Status	SDG Link
Water Usage Intensity	2024: 14,620 KL / 9,162 t = 1.596 KL/t (about 1.60 KL/t). Site reported value: 1.59 KL/t.	Monthly	<= 1.25 KL/tonne by end-2026	Engineering / EHS	On Track - management status; confirm against current monthly/YTD data	SDG 6; SDG 12

Calculation check: 14,620 / 9,162 = 1.5957 KL/tonne. Rounded to two decimals, the calculated baseline is 1.60 KL/tonne. The 1.25 KL/tonne target therefore represents an improvement of approximately 21.7% from the calculated baseline. If the controlled 2024 source records support 1.59 KL/tonne using more precise underlying values, that controlled value may be retained; otherwise 1.60 KL/tonne should be used for arithmetic consistency.

7.7 Water Risk Assessment

The assessment below is a site-level screening of water-related risks within the Rewari facility's area of influence and its canal-water dependency. The site relies on canal water for routine fresh-water supply; therefore the principal dependencies are continuity and quality of canal supply, seasonal availability, treatment performance, efficient use, reuse, local recharge and responsible management of shared water resources. The assessment shall be reviewed annually and whenever there is a significant change to production, water source, treatment systems, legal requirements, stakeholder concerns or water performance.

No.	Water-Related Risk	Potential Effect	Existing / Planned Control	Initial Rating	Residual Rating
WR-01	Interruption or restriction of canal-water supply	Production disruption; reduced utility availability	Intake monitoring; storage; operating controls; source-continuity review; escalation through utilities/management	High	Moderate
WR-02	Seasonal variability / extreme weather affecting source availability	Reduced supply reliability and higher competition for water	Monthly withdrawal tracking; water-intensity target; reuse; three rainwater recharge wells; contingency review	High	Moderate
WR-03	Variation in incoming water quality	Higher treatment load; RO performance loss; chemical/energy increase	WTP log monitoring of TDS, pressures, flows and quality; MGF/ACF/RO control; trend review	Moderate	Moderate
WR-04	Low RO recovery or increased reject generation	Higher fresh-water demand and ETP load	Feed/permeate/reject trend review; recovery and TDS checks; maintenance trigger	Moderate	Low
WR-05	Excess cooling-tower make-up or blow-down	Higher withdrawal and wastewater generation	Closed-loop cooling; make-up metering; cycles-of-concentration and blow-down review	Moderate	Moderate
WR-06	Leaks, overflow or uncontrolled water loss	Avoidable consumption; poor balance closure	Routine walk-down; tank-level control; meter/log review; corrective maintenance	Moderate	Low
WR-07	ETP/STP treatment or reuse-quality deviation	Reduced safe reuse; compliance risk	Operator logs; pH/flow/dosing checks; laboratory compliance testing where required; corrective action	Moderate	Moderate
WR-08	Failure to achieve water-intensity target	Higher cost and weaker stewardship performance	Monthly KPI review; Engineering/EHS ownership; action plan; management escalation	Moderate	Moderate
WR-09	Rainwater recharge wells blocked or ineffective	Reduced replenishment benefit	Periodic inspection, cleaning and maintenance; rainfall/recharge records where feasible	Low	Low
WR-10	Incomplete annual disclosure or plan review	ASI / stakeholder assurance weakness	Annual public disclosure; document control; scheduled review and change/control-gap triggers	Moderate	Low
WR-11	Shared-water or stakeholder concern	Reputational / social licence impact; need for additional controls	Stakeholder engagement channels; grievance/RFI mechanism; response tracking; management review	Moderate	Low

Risk interpretation: ratings are management-screening categories based on the evidence reviewed in this study. Materiality shall be reconsidered if monitoring data, legal requirements, source conditions, stakeholder inputs or business changes indicate a higher level of risk. Where a material risk is identified, the action plan and public disclosure shall be updated accordingly.

7.8 Stakeholder Engagement Framework

Water stewardship is supported by structured engagement with groups that can affect, or be affected by, the site's water use. The following framework defines the relevant groups, water-related interests, engagement routes and records to be maintained. It is intended to ensure that water-related inputs are considered in objectives, risk review and improvement actions without creating unnecessary administrative burden.

Stakeholder Group	Water-Related Interest / Input	Engagement Route	Management Response / Record
Operators and workers	Reliable supply, leaks, overflows, safe treatment operation, practical improvement ideas	Shift handover, log sheets, toolbox / departmental review	Operating logs, maintenance requests, corrective actions and improvement suggestions
Engineering / EHS	Water balance, efficiency, reuse, legal compliance, target performance	Monthly KPI and utility review	Monthly water statement, KPI trend, action tracker
Plant management	Performance, resources, risks, business continuity, public commitments	Management review / sustainability review	Decisions, resources, targets and assigned actions
Canal / water-supply authority and relevant local	Supply continuity, conditions of supply and source management	Utility coordination and formal communication as applicable	Supply records, correspondence and action follow-up

Stakeholder Group	Water-Related Interest / Input	Engagement Route	Management Response / Record
authority			
Regulatory authorities	Effluent quality, treated-water management, legal and consent conditions	Statutory reporting, inspection and formal communication	Compliance reports, laboratory reports and corrective actions
Nearby community / local stakeholders	Shared-water availability, local environmental concerns, nuisance or grievance	Stakeholder / grievance / RFI channel and local engagement as required	Concern log, response, corrective action and closure evidence
Customers / ASI / sustainability stakeholders	Responsible water use, transparency, progress against target	Public sustainability disclosure, website information and audit evidence	Published water information, audit records and improvement commitments

Records of significant water-related inputs, decisions and responses shall be retained. Where an input identifies a new or changed material water risk, the Water Management Programme and associated targets shall be reviewed.

7.9 Rainwater Harvesting and Recharge

Three rainwater recharge wells have been constructed at the site. Rainwater collected from suitable drainage / collection areas is directed to these wells for local recharge. The recharge system supports the replenishment hierarchy by returning rainfall to the local water environment rather than relying only on fresh-water withdrawal. The wells should be inspected before and during the monsoon period, kept free from blockage and silt, and maintained so that recharge pathways remain effective.

Control	Current Arrangement	Recommended Record
Recharge infrastructure	Three rainwater recharge wells in place	Well identification / location record and maintenance register
Rainwater routing	Collected rainwater directed to recharge wells	Drainage / routing confirmation and seasonal inspection record
Maintenance	Cleaning / desilting and blockage checks	Pre-monsoon and periodic maintenance record
Performance	Recharge benefit recognised as a replenishment measure	Rainfall and estimated/monitored recharge quantity where technically feasible

7.10 Public Disclosure and Management Review

GLS maintains public disclosure of water stewardship information through its public sustainability / website disclosure mechanism. The disclosure should be updated at least annually and should include water withdrawal and use by source and type, water-intensity performance against target, treated-water reuse, the principal water-related risks and management actions, rainwater recharge measures and progress on improvement commitments.

Review Trigger	Requirement
Scheduled review	Review the Water Management Programme at least once every five years, with annual review of KPI and water-risk information.
Business change	Review whenever production, process, water source, treatment capacity, site footprint or other business change could alter material water-related risk.
Control gap	Review whenever meter imbalance, abnormal consumption, repeated treatment deviation, leakage, target failure, audit finding or other evidence indicates a control gap.
Stakeholder / regulatory input	Review when significant water-related stakeholder input, legal change or supply-authority requirement affects the current controls or targets.
Public disclosure	Keep the latest public water-management information available and update annual performance information.

7.11 ASI Principle 7 Alignment Summary

The following table shows how this study is structured to address the principal requirements of ASI Performance Standard V3.1 Principle 7. The full technical study remains a controlled document; public-facing information may be presented in a concise disclosure format.

ASI Requirement	Evidence in this Study	Current Position
7.1(a) - Annual water withdrawal and use by source/type	Canal source mapping; five core meters; WTP/ETP/STP logs; monthly water balance framework; water-intensity KPI	Framework established; annual public totals to be derived from controlled monthly data
7.1(b) - Water-related risk assessment within area of influence	Section 7.7 water risk assessment covering source continuity, seasonality, quality, treatment, efficiency, recharge and shared-water considerations	Assessment established; review annually and on change
7.2(a) - Water management plan with time-bound contextual targets and affected-group inputs	Sections 7.6-7.10; target <=1.25 KL/t by end-2026; stakeholder engagement framework; action plan	Established in this Issue 1 study
7.2(b) - Periodic review	Section 7.10 requires review at least every five years	Established
7.2(c) - Review after business changes affecting material risk	Section 7.10 business-change trigger	Established
7.2(d) - Review on indication of a control gap	Section 7.10 control-gap trigger	Established
7.2(e) - Public disclosure of latest water management information	Section 7.10 public disclosure arrangement	Established as an annual disclosure requirement

8. Improvement Action Plan

Time Horizon	Action	Responsibility	Expected Output
Routine / Monthly	Continue daily flow-meter and WTP/ETP/STP log entries; compile monthly totals and calculate water balance.	Utilities / EHS	Traceable monthly water statement.
1-3 months	Standardise one monthly water-balance format covering intake, use, treatment, reuse, discharge and storage change.	Utilities / Sustainability	Consistent management reporting.
Routine / Monthly	Track water intensity monthly against production; review progress toward <=1.25 KL/tonne by end-2026.	Engineering / EHS	Monthly KPI trend and corrective action where required.
3-6 months	Review RO recovery and salt rejection using paired feed/permeate/reject readings.	Utilities	RO performance trend and maintenance trigger.
3-6 months	Review cooling-tower cycles of concentration and blow-down control.	Utilities / Maintenance	Lower make-up and blow-down where technically feasible.
3-6 months	Evaluate additional ETP/STP/RO-reject reuse where water quality and process suitability permit.	EHS / Utilities	Higher reuse percentage.
Annual / on change	Review the water risk assessment and update controls when source conditions, business changes, stakeholder inputs or monitoring indicate a changed risk.	Sustainability / Engineering / EHS	Current water-risk register and action plan.
Pre-monsoon / Periodic	Inspect and maintain the three existing rainwater recharge wells; retain cleaning/desilting and routing records.	Engineering / EHS	Functional recharge system and maintenance evidence.
Annual	Update public water disclosure with withdrawal/use, water intensity, reuse, principal risks, recharge measures and progress.	Sustainability / EHS	Current public disclosure.
Annual / as required	Review significant water-related stakeholder inputs and record	EHS / Management	Stakeholder input and response record.

Time Horizon	Action	Responsibility	Expected Output
	management response / actions.		

9. Indicative CAPEX and OPEX

The values below are planning-level ranges only. They are not quotations and should be confirmed through site engineering and vendor offers before any approval.

Improvement Item	Indicative CAPEX	Indicative Annual OPEX / Note
Optional RO feed/permeate/reject and softener-backwash metering	₹1.5-3.5 lakh	₹0.25-0.50 lakh
Pump automation / VFD or level control where technically required	₹3-6 lakh	Approx. ₹0.2 lakh
Centralised data logging / dashboard for water meters	₹3-8 lakh	₹1-2 lakh
Cooling-tower water-chemistry / CoC optimisation	₹5-15 lakh	₹2-4 lakh; may be offset by water savings
RO-reject reuse piping / minor works	₹1-3 lakh	Low routine OPEX
ETP/STP reuse expansion	₹2-6 lakh	₹0.5-1.5 lakh
Existing rainwater recharge wells - inspection, cleaning / desilting and monitoring	Existing infrastructure	Routine maintenance / site-specific

10. Pathway to Water Neutrality

Water neutrality should be treated as a measured programme, not as a label. The sequence should be to measure, reduce avoidable demand, maximise safe reuse, address residual consumptive use through replenishment, and then verify and disclose the result.



Figure 3. Practical water-stewardship roadmap for GLS.

Step 1 - Measure

Use the five core meters and treatment-plant logs to maintain a reliable monthly and annual baseline and track progress against the <=1.25 KL/tonne target.

Step 2 - Reduce

Control visible losses, optimise cooling-tower and RO performance, and manage pumps against actual demand.

Step 3 - Reuse

Quantify existing ETP/STP reuse, evaluate technically suitable additional reuse and keep reuse percentage as a management KPI where data quality allows.

Step 4 - Replenish and Verify

Maintain the three existing rainwater recharge wells, quantify replenishment where technically feasible, address residual consumptive use, and verify and publicly disclose the basis of any future water-neutrality statement.

11. Conclusion

The GLS water system has a clear operating structure covering canal-water intake, treatment, storage, process cooling, drinking and sanitary supply, wastewater treatment and reuse. The closed-loop cooling arrangement limits fresh-water demand to make-up losses rather than total circulation. ETP and STP treated water are already used for non-potable purposes.

The key management strength confirmed by the supplied evidence is that operators are maintaining WTP, ETP and STP log sheets and recording operating data. This practice should now be used systematically to produce a monthly water balance, reuse percentage and water-intensity KPI. The available WTP readings also indicate strong RO TDS reduction at the sampled times, supporting effective treatment performance as an operating trend.

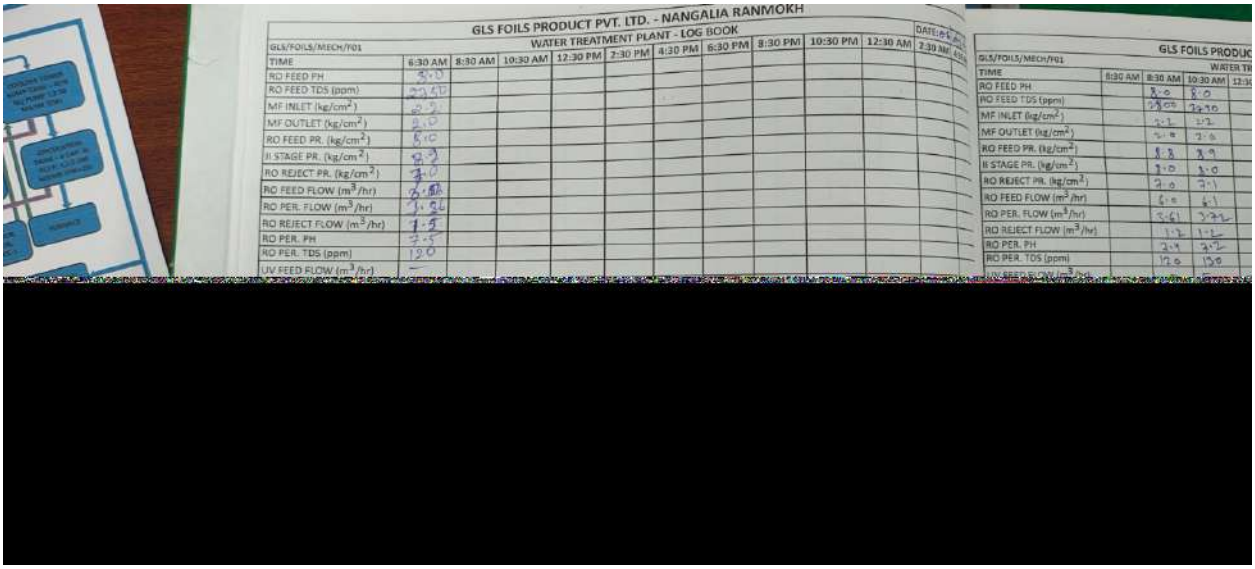
The management programme now combines operating logs, five core meters, a monthly water-intensity KPI, a 2026 target, a site-level water risk assessment, treated-water reuse, three rainwater recharge wells, stakeholder engagement routes, public disclosure and defined review triggers. The priority is to maintain data discipline, review progress monthly, update the water-risk assessment annually or on change, and use measured results to drive further reduction, reuse and replenishment actions.

Appendix A - Glossary

Term	Meaning
KL	Kilolitre; 1 KL = 1 cubic metre = 1,000 litres.
m^3/hr	Cubic metres per hour.
RO	Reverse Osmosis.
ETP	Effluent Treatment Plant.
STP	Sewage Treatment Plant.
MGF	Multi-Grade Filter.
ACF	Activated Carbon Filter.
AHU	Air Handling Unit.
CFM	Cubic Feet per Minute, an air-flow unit.
TDS	Total Dissolved Solids.
TH	Total Hardness.
CoC	Cycles of Concentration in a cooling-water system.
Closed loop	A system in which circulating water returns after use and only losses are replaced by make-up water.
Water intensity	Water use divided by a defined production or business-output quantity.
Water reuse	Use of treated wastewater for a beneficial non-potable application instead of fresh water.
Water risk	Potential effect of water availability, quality, operational performance, compliance or shared-water conditions on the site or affected stakeholders.
Recharge well	A structure used to direct collected rainwater into the ground for local recharge.
Water intensity KPI	Fresh-water use divided by production quantity for the same reporting period, expressed here as KL/tonne.

Appendix B - Sample Operating Log Evidence

WTP Operating Log - Sample Evidence



GLS FOILS PRODUCT PVT. LTD. - NANGALIA RANMOKH

WATER TREATMENT PLANT - LOG BOOK

GLS/FOILS/MECH/F01 TIME	6:30 AM	8:30 AM	10:30 AM	12:30 PM	2:30 PM	4:30 PM	6:30 PM	8:30 PM	10:30 PM	12:30 AM	2:30 AM
RO FEED PH	8.0										
RO FEED TDS (ppm)	2960										
MF INLET (kg/cm²)	2.2										
MF OUTLET (kg/cm²)	2.0										
RO FEED PR. (kg/cm²)	8.8										
II STAGE PR. (kg/cm²)	8.2										
RO REJECT PR. (kg/cm²)	7.0										
RO FEED FLOW (m³/hr)	6.8A										
RO PER. FLOW (m³/hr)	3.96										
RO REJECT FLOW (m³/hr)	1.5										
RO PER. PH	7.5										
RO PER. TDS (ppm)	120										
UV FEED FLOW (m³/hr)	—										

The sample WTP record shows routine entries for RO feed/permeate quality, pressures, flows, tank levels and daily water quantities.

ETP Operating Log - Sample Evidence



The sample ETP record shows time-based tank levels, pH, flow indication, chemical dosing and treated-water information.

STP Operating Log - Sample Evidence



The sample STP record shows pump operation, run time, chemical dosing, waste generation and treated-water flow information.

Appendix C - Hydrological Context and Location Map

Purpose. This appendix supplements the water-risk and stewardship sections of the GLS Water Management Study by documenting the hydrological context of the Rewari facility, the source-water dependency on the nearby Jawahar Lal Nehru Canal, the local groundwater and surface-water setting, and the site's rainwater-recharge measures.

Hydrological context summary. GLS Aluminium Industries Pvt. Ltd., Rewari obtains its principal freshwater requirement from the Jawahar Lal Nehru (JLN) Canal, located approximately 1.5 km from the plant. The canal is the relevant operational source-water system for the facility. The broader local setting is a dry to semi-arid part of Rewari District with comparatively low rainfall and regionally stressed groundwater conditions. The site does not rely on groundwater as its normal primary water source. Three rainwater recharge wells are available within the facility, and collected rainwater is directed to these structures as part of the site's water stewardship and replenishment approach.

Indicative location reference coordinates

The coordinates below are indicative map-reference coordinates prepared from the supplied site-location map and facility location information. They are suitable for report-level reference and should be field-verified by GPS if exact engineering or statutory coordinates are required.

Reference point	Approximate latitude	Approximate longitude	Remarks
GLS Aluminium Industries plant site	28.228° N	76.646° E	Indicative reference point for the Rewari facility.
Jawahar Lal Nehru Canal - nearest relevant reach	28.217° N	76.636° E	Indicative canal reference point located near the site water-supply alignment; approximately 1.5 km from the plant.

Figure C1. Indicative location map showing GLS Aluminium Industries Pvt. Ltd. and the nearby Jawahar Lal Nehru Canal.



Source: supplied site-location map reference. The image is used as a location aid within this report.

Hydrological assessment summary

The table below records the principal hydrological observations relevant to ASI Principle 7 water-risk assessment and the site water-management plan.

Hydrological aspect	Assessment for GLS Rewari	Management implication	Status
Watershed / source-water identification	The facility's principal freshwater dependency is the Jawahar Lal Nehru Canal located	The canal-water dependency should be explicitly recognised in annual water-risk review and business	Established

	approximately 1.5 km from the plant. For water-risk purposes, the canal is the relevant supply-water system; the natural drainage context of Rewari is considered separately.	continuity planning.	
Water availability / scarcity risk	The Rewari area is dry to semi-arid and the facility depends on an external canal-water system serving a wider regional demand base. Seasonal variability, scheduled maintenance, pumping interruption or reduced regional allocation could affect source-water availability.	Inherent risk is assessed as Medium. Continued reduction of water intensity, storage management, reuse and routine monitoring remain important.	Established
Groundwater context	Groundwater is not the normal primary operating-water source for GLS. This reduces the facility's direct dependence on a regionally stressed aquifer system and is favourable from a stewardship perspective.	Direct operational dependency is Low; however, regional groundwater stress supports the continued use of recharge measures and water-efficiency initiatives.	Established
Surface-water context	The JLN Canal is the primary surface-water feature relevant to the plant's freshwater supply. The canal	Source-water quality and availability should remain within routine operational review.	Established

	should be treated as the supply-water source for operational water-risk assessment and source-water monitoring.		
Rainwater recharge / replenishment	Three rainwater recharge wells have been provided at the site. Collected rainwater is directed to these wells for groundwater recharge.	This is a positive stewardship control and supports the site's replenishment approach.	Implemented
Flooding / local runoff	Although the district is comparatively dry, monsoon rainfall can create short-duration runoff conditions. Internal storm-water drainage and recharge structures should be maintained prior to the monsoon season.	Routine pre-monsoon inspection, cleaning and maintenance should continue.	Operational control in place
Water-quality risk	The site treats canal water through filtration, softening and reverse osmosis for relevant uses. WTP operating logs demonstrate ongoing quality and process-control monitoring; ETP and STP logs demonstrate routine treatment-plant monitoring.	Treatment monitoring provides a sound operational control basis and supports monthly review.	Implemented
Overall hydrological	Considering single-source canal	Existing controls include flow	Established and

risk conclusion	dependency, regional rainfall variability and the stressed groundwater context, the facility's inherent water-availability risk is assessed as Medium. Existing controls reduce exposure.	monitoring, treatment-plant logs, closed-loop cooling, ETP/STP reuse, water-intensity tracking and three recharge wells.	controlled

Management conclusion. The hydrological setting does not indicate an immediate source-water deficiency for the current operating arrangement; however, the site remains dependent on a single canal-water source in a comparatively water-stressed regional context. Accordingly, source-water review, water-intensity tracking, reuse optimisation, maintenance of rainwater recharge wells, and periodic risk re-evaluation shall continue as part of the site's water stewardship programme.

Review trigger. This hydrological assessment and the associated water management plan shall be formally reviewed at least once every five years, and earlier where there is a significant business change, source-water change, major process change, expansion, or evidence of a control gap affecting water performance or water-related risk.

Appendix D - ASI Principle 7 Clause-wise Mapping and Status

The following table summarises how the GLS Water Management Study addresses the principal requirements of ASI Performance Standard Principle 7 (Water Stewardship). The status statements are framed in professional audit language and are intended to support management review and conformance tracking.

ASI clause	Requirement focus	GLS evidence in this report	Status	Professional evaluation
7.1(a)	Annual identification and disclosure of water withdrawal and water use by source and type	Water source, system flow, five principal meters, WTP/ETP/STP operating logs, water-intensity KPI, reuse routes and public disclosure mechanism are documented.	Substantially established	The operational framework is in place. Annual consolidation of actual meter-based totals and continued public disclosure shall be maintained each reporting cycle.
7.1(b)	Annual assessment of water-related risks within the Area of Influence / watershed context	Hydrological context, JLN Canal dependency, groundwater and surface-water context, rainwater recharge measures, and site-level water-risk assessment are documented.	Established	The report provides a site-relevant hydrological and risk context suitable for annual review and management action.
7.2(a)	Water management plan with contextual targets and engagement with relevant affected groups and	Monthly water KPI, target of <=1.25 KL/tonne by end-2026, action plan, reuse programme, review inputs from internal and	Established	The plan is implemented through defined actions, responsibilities and management controls.

	organisations	external interested groups, and stewardship measures are defined.		Continued recording of inputs, concerns and responses should be maintained.
7.2(b)	Formal review of the water management plan at least every five years	A formal review trigger is stated in Appendix C and the management review framework.	Established	The periodic review requirement is now explicitly defined.
7.2(c)	Review of the plan where business changes materially affect water-related risks	The report requires review following significant business change, source-water change, expansion or major process change.	Established	The change-management trigger is clearly defined.
7.2(d)	Review of the plan where a control gap is indicated	The report requires review where evidence indicates a control gap affecting water performance or water-related risk.	Established	The control-gap review trigger is explicitly defined.
7.2(e)	Public disclosure of the latest water management plan	The report records that water stewardship information is included in the company's public disclosure mechanism and should be updated using the	Established	Public disclosure is recognised as a continuing management obligation and should be kept current.

latest approved
position.

Overall status statement. The GLS Water Management Study now provides a comprehensive water stewardship document integrating system mapping, operational evidence, performance KPI, hydrological context, water-risk assessment, recharge measures, improvement planning and ASI Principle 7 clause-wise status mapping. Continued annual data consolidation and periodic management review will sustain the effectiveness of the programme.

ANNEXURE E - WASTEWATER BALANCE AND DISCLOSURE

Technical supplement dated 15 November 2026 | Base data period: calendar year 2024 | Original: Water Management Study, Issue 1, 16 September 2026

E.1 Public availability of the wastewater management plan

The GLS public policies webpage was checked on 15 November 2026. It lists the **GLS Wastewater Management Study, ASI 6.2 / 6.3, Issue 01**, as a published report alongside the Water Management Study. The wastewater study covers wastewater routes, ETP/STP systems, reuse, discharge monitoring and spill/leakage management.

Public source	Publication confirmation
GLS policies page	https://glsaluminium.com/policies.html
Dedicated public wastewater report	https://glsaluminium.com/assets/policies/GLS_Wastewater_Management_Study_ASI_6.2_6.3_Issue_01.pdf
Published wastewater report - page 8	Annual quantity statement lists the required ETP/STP and discharge metrics; actual annual totals are not supplied there.
Published FY 2025-26 sustainability report - page 31	Confirms that total withdrawal, discharge and consumption volumes by source were not included in its evidence pack.

E.2 Evidence available in GLS source studies

Parameter	Source-confirmed information
Water-use baseline (2024)	14,620 KL and 9,162 tonnes of production; 1.596 KL/tonne calculated in separately published Water Management Study, page 4.
Wastewater handling	Industrial process wastewater, cooling blow-down, RO reject and softener backwash routed to ETP; sanitary wastewater to STP (Wastewater Study pages 3 and 5).
Reuse pathways	ETP-treated water for floor cleaning; STP-treated water for gardening (Wastewater Study pages 3, 5 and 7).
Monitoring	ETP/STP output records, discharge accounting and annual reporting format appear in Wastewater Study Section 6, page 8.

Quantity classification. The 14,620 KL water-use baseline is source-reported and is used as the withdrawal proxy for this calculation, pending intake-meter reconciliation. Wastewater totals in the next pages are engineering-calculated from a fully stated water-balance allocation. They are not represented as annual flow-meter readings, regulatory discharge returns or certified treatment records.

E.3 CALCULATED WATER AND WASTEWATER BALANCE - 2024

Reporting unit: KL/year (equivalent to m3/year). Water-use baseline used as withdrawal proxy: **14,620.0 KL**. All return/recovery coefficients below are engineering allocation inputs to be reconciled with the site's existing records.

Branch / operating factor	Calculation basis	Quantity (KL/y)
Cooling make-up	60% of withdrawal	8,772.0
Sanitary / canteen supply	25% of withdrawal	3,655.0
Other process / utilities	15% of withdrawal	2,193.0
Cooling-tower blow-down to ETP	25% of cooling make-up (approx. 4 concentration cycles)	2,193.0
Sanitary sewage returning to STP	80% of sanitary supply	2,924.0
Process and utility returns to ETP	40% of other utility allocation	877.2
ETP influent - total	Cooling blow-down plus process/utility wastewater	3,070.2
STP influent - total	Sanitary return	2,924.0

E.4 Consolidated quantities - calculated pathway

Indicator	Formula / disposition	KL/year
Total wastewater generated	ETP influent + STP influent	5,994.2
Total wastewater entering treatment	ETP + STP feed	5,994.2
Total treated-water output	95% of each plant's calculated influent	5,694.5
ETP-treated water reused	ETP output assigned to floor-cleaning reuse	2,916.7
STP-treated water reused	STP output assigned to gardening reuse	2,777.8
Total treated wastewater reused	Sum of ETP and STP reuse under full-reuse pathway	5,694.5
External wastewater discharge	Calculated full-reuse pathway only; actual discharge NOT verified	0.0
Treatment loss / sludge-water adjustment	Generated less treated output	299.7

Discharge qualification: The displayed 0.0 KL is a **conditional model result for the full-reuse pathway**. It must not be cited as a verified nil-discharge declaration unless drainage arrangements, treated-water use registers and statutory discharge records support that conclusion.

E.5 WATER-BALANCE CLOSURE AND VALIDATION

Calculation closure follows the same water boundary and period as the original 2024 withdrawal-intensity baseline. Internal cooling-water circulation is excluded from freshwater withdrawal, and treated reuse is not counted as a second new intake.

Water-balance component	KL/year	Calculation
Freshwater withdrawal proxy	14,620.0	2024 reported water-use baseline used for reconciliation
Consumption before wastewater treatment	8,625.8	Withdrawal minus wastewater generation
Losses in ETP/STP treatment	299.7	Generated wastewater minus treated output
Treated water reused and then consumed on-site	5,694.5	ETP floor cleaning + STP gardening
Discharged to an external receptor - model pathway	0.0	Conditional full-reuse result; confirm actual outfalls
Total accounted for	14,620.0	Sum of consumption, treatment loss, reuse end-use and external discharge
Unaccounted difference	0.0	Freshwater withdrawal minus accounted amount

Basic control equation: Withdrawal = pre-treatment consumptive losses + treatment loss + final consumption of reused water + external discharge + change in storage. Change in storage is held at zero for this closed annual engineering reconciliation; actual start/end tank inventories require checking.

E.6 Required confirmation against operating evidence

Evidence / check	Responsibility and required validation
Canal intake totaliser	Utilities: confirm annual opening/closing readings and 2024 total 14,620 KL.
ETP influent and treated-water output	ETP operator / EHS: extract monthly treatment volumes and floor-cleaning reuse from meter totals and logs.
STP influent and treated-water output	STP operator / EHS: extract monthly sewage treatment and gardening reuse from totalisers/logs.
RO reject, softener backwash, cooling blow-down	Engineering: reconcile operating quantities with ETP influent; use defined, recorded calculation factors only when meter readings are unavailable.
Any discharge outfall, bypass or tanker removal	EHS: verify consent conditions, drainage plan, outfall records and incidents before making an annual external-discharge declaration.
Public annual statement	Sustainability/EHS: publish the verified calendar/FY totals with period, boundary, source and calculation method; ensure 2024 is not represented as FY2025-26.

E.7 ASI and GRI reporting interpretation

ASI Performance Standard V3.1 Criterion 6.2 concerns annual reporting of material discharges to water and associated management controls. GRI 303 separates withdrawal, discharge and consumption; recycled/reused internal water is a separate operational indicator and must not be double-counted as additional withdrawal. The final externally disclosed quantities should be based on reconciled records, with any estimation method specifically identified in the data basis.

Document control: This appendix is a later technical supplement. The original 32-page Issue 1 water study and its release date remain unchanged.