Business Case

Water Meter Monitoring — City Life, 477 Anton Lembede Street, Durban

Prepared by: Jason van Wyk, Precept Systems **Prepared for:** Mosaic Group — Tanya Dowley **Status:** Draft for client review

1. Executive Summary

What gets measured gets managed.

Mosaic Group's City Life building currently spends approximately **R1.2 million per month** on water for 27 floors. The first 12 floors under Mosaic Group's management account for an estimated **R533,000/month** — yet tenant water charges recover only **R230,400/month** (43% cost recovery). That leaves a shortfall of approximately **R302,600 every month**.

R533K	R230K	R303K	43%
Monthly Water Cost (12 floors)	Monthly Tenant Revenue	Monthly Shortfall	Cost Recovery Rate

This business case proposes installing smart water meters on all 576 units and 12 floor bulk meters across the first 12 floors, with a monitoring platform that provides real-time visibility, automated billing data, and leak detection. **Three pillars drive the value:**

1. **Conservation through awareness** — When tenants know their usage is measured, consumption typically drops 10–25%. At 15%, that saves ~R80,000/month.
2. **Fair billing and cost recovery** — Usage-based billing replaces the flat R400/month charge, lifting revenue from R230K to R373K–R627K/month depending on the rate applied.
3. **Leak detection** — Bulk-vs-unit meter reconciliation per floor identifies leaks immediately. A single running toilet costs ~R4,900/month. A concealed pipe leak costs ~R14,800/month.

Investment Overview

Component	Est. Cost (ex VAT)	Procured From
Smart meters (588 units)	R1,321,920	Precision Meters (direct)
IoT telemetry hardware (588 nodes)	R441,000	Precept Systems
Platform development and integration	R70,200–R105,600	Precept Systems
Deployment, installation and training	R31,800–R48,000	Precept Systems
Infrastructure (gateways, server, NAS)	R47,000–R65,000	Precept Systems
Total capital	**~R1,912,000–R1,982,000**	

The system pays for itself within 6–10 months. Every month without metering is another R302,600 in unrecovered water costs.

2. Current State Analysis

2.1 Water Costs

Metric	Value
Total building water bill	R1,200,000/month
Municipal water tariff	R65.91/kL
Reported total consumption	~10,500 kL/month (all 27 floors)
Effective all-in rate	~R114/kL

The difference between R65.91/kL tariff and ~R114/kL effective rate likely includes sewage/sanitation surcharges and/or fixed municipal charges. Whether the sewage component is consumption-based needs to be confirmed with eThekwini Municipality. Financial calculations use the effective all-in rate (~R114/kL) as the base case.

2.2 Twelve-Floor Estimate

Metric	Value
Share of building	12 ÷ 27 = 44.4%
Estimated consumption	~4,667 kL/month
Estimated water cost	~R533,000/month
Annual water cost	~R6,400,000/year

2.3 Revenue Model

Metric	Value
Total tenants (12 floors)	576
Flat monthly water charge	R400/tenant
Monthly tenant revenue	R230,400
Monthly water cost	~R533,000
Monthly shortfall	**~R302,600**
Annual shortfall	~R3,631,200
Cost recovery rate	43%

2.4 Per-Tenant Economics

Metric	Value
Average consumption	~8.1 kL/month
Average cost (all-in)	~R923/month
Amount charged	R400/month
Subsidy per tenant	**~R523/month**

2.5 Pain Points

Problem	Impact	Business Risk
No usage visibility	Cannot identify high consumers, waste, or anomalies	Operating blind on a R6.4M/year expense
No tenant incentive	Flat R400 charge regardless of usage	No motivation to conserve or report leaks
No leak detection	Leaks detected visually or when reported	Hidden leaks accumulate undetected
Manual reading impractical	576 meters daily — labour-intensive, error-prone	Not a viable alternative
Cost gap widening	Tariffs increase annually; R400 flat has not kept pace	Shortfall grows every year
ERP disconnect	No automated data flow to CLTM tenant management	Administrative overhead and errors

3. Proposed Solution Benefits

3.1 Pillar 1 — Conservation Through Awareness

Published residential studies consistently show that metering and feedback reduce water consumption by **10–25%**, with a commonly cited median of **15%**.

Scenario	Reduction	kL Saved/Month	Monthly Saving (at R114/kL)	Annual Saving
Conservative	10%	467 kL	R53,200	R638,700
Base case	**15%**	**700 kL**	**R79,800**	**R958,000**
Optimistic	25%	1,167 kL	R133,000	R1,596,000

If the sewage component is not consumption-based, conservation savings at R65.91/kL would be approximately 58% of figures above — e.g., base case ~R554,000/year.

3.2 Pillar 2 — Fair Billing and Cost Recovery

Replacing the flat R400/month with usage-based billing shifts cost recovery dramatically:

Billing Rate	Revenue/Month	vs Current R230K	Gap to R533K Cost	Cost Recovery
R400 flat (current)	R230,400	—	-R302,600	43%
R80/kL	R373,360	+R143,000	-R159,640	70%
R100/kL	R466,700	+R236,300	-R66,300	88%
R114/kL (at cost)	**R532,138**	**+R301,700**	**-R862**	**~100%**
R130/kL	R606,710	+R376,300	+R73,710	114%

> Even at a conservative R80/kL, monthly revenue increases by R143,000 — nearly **R1.72M/year** in additional cost recovery. At R114/kL, the shortfall is eliminated entirely.

3.3 Pillar 3 — Leak Detection

Bulk meters on each floor's 50mm branch enable **bulk-vs-unit reconciliation**: any discrepancy indicates water loss.

Leak Type	Typical Flow	Monthly kL	Monthly Cost	Detection Method
Running toilet (1 unit)	1 L/min	~43 kL	~R4,900	Unit meter: continuous flow
Dripping tap	0.25 L/min	~11 kL	~R1,250	Unit meter: elevated baseline
Pipe leak (concealed)	3 L/min	~130 kL	~R14,820	Bulk > sum of unit meters
Major pipe burst	10+ L/min	~432 kL	~R49,250	Bulk meter alarm

> **Without metering, these leaks run undetected for months.** If 5% of units have an undetected running toilet (29 units), that alone costs ~R142,000/month — nearly half the current shortfall.

3.4 Operational Benefits

Benefit	Description
Automated meter reading	Eliminates manual reading of 576 meters — readings delivered every 5–15 minutes
CLTM ERP integration	Consumption data fed directly into tenant management system via API
Management reporting	Automated daily, weekly, monthly reports per floor and per unit
Anomaly detection	Alerts for unusual patterns, zero-flow, continuous flow
Dispute resolution	Timestamped, tamper-evident consumption data
Municipal bill verification	Compare building total against municipal meter reading
Foundation for future	Upper 15 floors, motorised valves, other Mosaic properties

Motorised ball valves: *Not included in this phase, but all hardware is* ***valve-ready*** *— connectors and driver circuitry are built into the IoT node PCB. Valves can be added in a future phase without replacing any components.*

4. Investment Required

4.1 Smart Meters (Precision Meters → Mosaic Group)

Precision Meters invoices Mosaic Group directly. Avoids markup; allows Mosaic to claim VAT.

Item	Qty	Unit Price	Total (ex VAT)
15mm ultrasonic (LoRaWAN)	576	R2,100	R1,209,600
50mm ultrasonic (LoRaWAN)	12	R9,360	R112,320
Total meters	**588**		**R1,321,920**

Pricing as quoted by Garth Le Roux, 3 Feb 2026. Volume discount pending from Precision Meters management.

4.2 IoT Telemetry Nodes (Precept Systems)

Item	Qty	Unit Cost	Total (ex VAT)
Precept IoT node (LoRaWAN, battery, valve-ready)	588	R750	R441,000

Includes LoRa radio, custom PCB, battery, enclosure, antenna, assembly/testing. R750/unit is a conservative estimate. Firm pricing in the Proposal.

4.3 Platform Development (Precept Systems)

Activity	Hours	Est. Cost
Platform adaptation and configuration	40–60	R24,000–R36,000
Custom node firmware	20–30	R12,000–R18,000
ChirpStack codec and device profile	10–15	R6,000–R9,000
CLTM ERP integration (API + Postman)	25–40	R15,000–R24,000
Operating manual	10–15	R6,000–R9,000
Project management	12–16	R7,200–R9,600
Total development	**117–176**	**R70,200–R105,600**

Hourly rate: R600/hr (ex VAT). Precept Systems is not VAT registered.

4.4 Deployment & Training (Precept Systems)

Activity	Hours	Est. Cost
Gateway config and network deployment	15–20	R9,000–R12,000
On-site installation & commissioning	30–50	R18,000–R30,000
Training (Sumir, building management)	8–10	R4,800–R6,000
Total deployment	**53–80**	**R31,800–R48,000**

Plumbing by Ryan (Mosaic in-house). Each unit has an isolation valve — shutoff is per unit only.

4.5 Infrastructure

Item	Est. Cost (ex VAT)
LoRaWAN gateways (4 units, indoor, PoE)	R28,000–R36,000
Server (production-grade, on-premises)	R12,000–R18,000
NAS backup device (2-bay, mirrored)	R7,000–R11,000
Total infrastructure	**R47,000–R65,000**

The LoRaWAN technology choice is validated in the Communications Technology Validation report (MGW-PRO-202602-005), which covers RF propagation analysis, alternative technology comparison, battery-life modelling, and 10-year TCO.

4.6 System Resilience

Tier	Method	Purpose
Tier 1 — Local	Daily backup to on-site NAS	Fast recovery from software failure
Tier 2 — Cloud	Daily off-site backup (SA-hosted)	Recovery from hardware failure/theft
Tier 3 — Meter	Smart meters store readings internally	No data loss during any outage

Containerised deployment (Docker). Rebuild from backup within 4–8 hours. Cloud migration option available.

4.7 Operating Costs (Monthly)

On-Premises Hosting

Platform monitoring	R500
Cloud backup storage	R100–R200
Maintenance reserve	R400–R800
Total monthly	**R1,000–R1,500**

Cloud-Hosted (Alternative)

SA-hosted cloud VPS	R800–R1,500
Platform monitoring	R500
Cloud backup + maintenance	R500–R1,000
Total monthly	**R1,800–R3,000**

4.8 Investment Summary

Category	Est. Amount (ex VAT)	Procured From
Smart meters (588)	R1,321,920	Precision Meters → Mosaic Group
IoT telemetry nodes (588)	R441,000	Precept Systems → Mosaic Group
Platform development and integration	R70,200–R105,600	Precept Systems → Mosaic Group
Deployment, installation and training	R31,800–R48,000	Precept Systems → Mosaic Group
Infrastructure (gateways, server, NAS)	R47,000–R65,000	Precept Systems → Mosaic Group
Total capital investment	**~R1,912,000–R1,982,000**	
Monthly operating (on-premises)	R1,000–R1,500/month	

All Precept Systems estimates are indicative. Firm pricing in the formal Proposal (MGW-PRO-202602-004).

5. Return on Investment

5.1 Annual Benefit Scenarios

Total annual benefit combines billing improvement (Pillar 2) with conservation savings (Pillar 1). Leak detection (Pillar 3) excluded from base case as event-dependent.

Scenario	Billing Rate	Conservation	Billing Gain/Year	Conservation/Year	Total Annual
Conservative	R80/kL	10%	R1,716,000	R639,000	**R2,355,000**
Base case	**R100/kL**	**15%**	**R2,836,000**	**R958,000**	**R3,794,000**
Optimistic	R130/kL	20%	R4,516,000	R1,277,000	**R5,793,000**

5.2 Payback Period

6.3 mo
Base Case Payback

10.2 mo
Conservative Payback

Scenario	Investment	Annual Net	Payback
Conservative	R1,982,000	R2,337,000	**10.2 months**
Base case	**R1,982,000**	**R3,776,000**	**6.3 months**
Optimistic	R1,982,000	R5,775,000	**4.1 months**

Investment uses upper-range estimate. Net benefit = gross minus ~R18K/year operating.

5.3 What If Only One Pillar Delivers?

Scenario	Annual Benefit	Payback
Billing only (R100/kL, no conservation)	R2,836,000	8.4 months
Conservation only (15% at R114/kL)	R958,000	25 months
Conservation only (15% at R65.91/kL)	R554,000	43 months
Leak detection only (~R165K/mo)	R1,982,000	12 months

> **The billing improvement alone justifies the investment** with payback under 9 months.

5.4 Break-Even Analysis

Break-even within 12 months if **any one** of the following occurs:

Condition	Threshold
Billing rate increase only	R400 → ~R690/month flat
Conservation only (at R114/kL)	31% reduction
Leak detection only	~R165,000/month (~1,450 kL)

In practice, all three pillars contribute simultaneously.

5.5 Five-Year Projection (Base Case)

Year	Cumulative Invest.	Cumulative Benefit	Cumulative Net	ROI
1	R2,000,000	R3,794,000	R1,794,000	90%
2	R2,018,000	R7,588,000	R5,570,000	276%
3	R2,036,000	R11,382,000	R9,346,000	459%
4	R2,054,000	R15,176,000	R13,122,000	639%
5	**R2,072,000**	**R18,970,000**	**R16,898,000**	**816%**

Assumes constant base case benefits (no tariff escalation). Real returns higher as tariffs rise annually.

6. Phased Approach

A phased rollout minimises risk, validates the solution before full commitment, and aligns with Mosaic Group's preference for phased payments.

6.1 Pilot Phase

Scope	1 floor: 6 unit meters + 1 bulk meter + 7 nodes + 1 gateway
Duration	6–8 weeks (incl. monitoring period)
Purpose	Validate RF, accuracy, ERP integration, platform

Pilot Investment

Item	Cost (ex VAT)	From
6× 15mm + 1× 50mm meters	R21,960	Precision Meters
7× IoT telemetry nodes	R5,250	Precept Systems
1× LoRaWAN gateway	R7,000–R9,000	Precept Systems
Platform setup, firmware, codec, commissioning	R40,000–R55,000	Precept Systems
Pilot total	**~R74,000–R91,000**	

What the Pilot Validates

- LoRaWAN signal through reinforced concrete
- Meter accuracy and pulse output reliability
- ChirpStack network server and codec
- CLTM ERP integration (automated billing)
- Dashboard and reporting (management acceptance)
- Per-unit installation time (refined rollout)

> **All pilot hardware is reused** in Phase 1 — nothing is throwaway.

6.2 Phase 1 — Remaining 11 Floors

Scope	11 floors: 570 unit + 11 bulk meters + 581 nodes + 3 gateways + server + NAS
Duration	8–12 weeks (~1 floor per week)
Prerequisites	Successful pilot, client approval

Phase 1 Investment (remaining after pilot)

Item	Cost (ex VAT)	From
570× 15mm + 11× 50mm meters	R1,299,960	Precision Meters
581× IoT telemetry nodes	R435,750	Precept Systems
3× LoRaWAN gateways	R21,000–R27,000	Precept Systems
Server + NAS	R19,000–R29,000	Precept Systems
Remaining dev, ERP, deployment, training, manual	R62,000–R99,000	Precept Systems
Phase 1 total	**~R1,838,000–R1,891,000**	

6.3 Future Phases (Not Priced)

Phase	Scope
Upper 15 floors	720 additional unit meters + 15 bulk + gateways
Motorised valves	Remote shutoff/throttling (system is valve-ready)
Other properties	Extend platform to additional Mosaic buildings

6.4 Why Phased?

Risk management	Pilot validates before committing R1.3M+ in meters
Cash flow	Payments spread, not single upfront commitment
Learning	Pilot process refined, applied to Phase 1
Confidence	Real data before full rollout — easier board approval
No waste	Pilot hardware reused — not a sunk cost

7. Risk Summary

Risk	Likelihood	Impact	Mitigation
Tenant resistance to usage-based billing	Medium	Medium	Gradual transition; conservative initial rate (R80/kL); transparent communication; show usage before billing change
RF coverage gaps in concrete building	Low–Med	Medium	4 gateways for redundancy; pilot validates; additional gateways can be added
ERP integration complexity	Medium	Medium	CLTM developer confirmed API model; Postman collection provided; pilot validates end-to-end
Installation disruption	Low	Low	Per-unit isolation valve; ~1 hour/unit; 10:00–14:00 schedule; advance notification
Meter pricing changes	Low	Medium	Volume discount pending; firm pricing locked before Phase 1 order
Load shedding	Medium	Low	Meters battery-powered; gateways on UPS PoE; data buffered, no readings lost
Server hardware failure	Low	Medium	Three-tier backup; containerised rebuild within 4–8 hours (Section 4.6)
Meter supplier dependency	Low	Low	Precision Meters is established with national distribution and SANS 1529 certification (Section 9)

8. Alternatives Considered

Option	Capital Cost	Annual Operating	5-Year TCO	Verdict
1. Status quo	R0	R0	R0 (but R18.2M unrecovered)	Not recommended
2. Manual meter reading	~R1.32M (meters only)	R150,000+ (labour)	~R2.1M	Not recommended
3. Prepaid meters	~R1.5–R2M	R50,000+	~R1.8–R2.3M	Rejected by client
4. SaaS platform (3rd party)	~R1.32M + R50–100K	R60K–R180K/year	~R1.7–R2.3M	Not recommended
5. Custom platform (Precept)	**~R1.91–R1.98M**	**R12–R18K/year**	**~R1.97–R2.07M**	Recommended

Why Not Manual Reading?

576 meters × 10 min/read × R28.79/hr = ~R2,764 per reading round. Monthly cost: ~R33,000. Annual: R150,000+. No real-time visibility, no leak detection, no ERP integration, data quality degrades with staff absence.

Why Not SaaS?

Subscription fees of R60K–R180K/year erode ROI. Vendor lock-in, data leaves site, limited customisation, CLTM integration may not be supported. Dependent on vendor's continued operation.

Why Custom Platform?

Lowest 5-year TCO. Full control. CLTM ERP integration built to spec. No recurring subscription. Data stays on-premises or SA-hosted. Expandable to other buildings. Proven architecture (Fairfield Dairy reference). **Mosaic Group receives full intellectual property** — all designs, schematics, firmware, code, and documentation (see Section 10).

9. Strategic Partnership — Precision Meters

Precept Systems operates in strategic partnership with Precision Meters, a specialist supplier of independently tested, SANS 1529-certified ultrasonic water meters. The monitoring platform has been designed, developed, and tested specifically for integration with Precision Meters' product range. This partnership is a foundation of the solution:

Factor	Benefit
Purpose-built integration	Firmware, payload codec, and dashboard engineered specifically for Precision Meters' pulse output and LoRaWAN protocol
Single-vendor consistency	One meter supplier — uniform data format, consistent accuracy, shared spare parts
Coordinated support	Precept provides field support in KwaZulu-Natal; Precision Meters provides product and technical support from Cape Town
Quality assurance	All meters independently tested and certified to SANS 1529 — industrial quality

> The monitoring platform — including firmware, payload codec, device profiles, and dashboard analytics — is **engineered exclusively for Precision Meters products**. This ensures the highest level of integration quality, reliable data accuracy, and a single point of accountability.

10. Intellectual Property and System Ownership

IP Handover

Full handover of all project deliverables at project completion (or upon completion of the final delivered phase if discontinued):

Deliverable	Format
Hardware schematics and PCB designs	Source files (KiCad)
Node firmware source code	Source repository
Application and API source code	Source repository
ChirpStack codec and device profiles	JavaScript source
Operating manual	PDF / Markdown
Architecture and config documentation	Technical docs

Ownership Terms

- **During development:** Precept retains working access for development and support.
- **Upon handover:** Mosaic Group owns all project-specific deliverables. Complete documentation, source code, and schematics can be provided to any service provider to continue maintenance.
- **Non-compete:** Mosaic Group may not share IP with a direct competitor of Precept Systems, provided Precept remains operational and available.
- **Reuse rights:** Precept may reuse underlying design/code patterns in other projects. This does not diminish Mosaic Group's ownership of their specific implementation.

11. Recommendation

~R1.98M	~R3.79M	6.3 mo	R16.9M	816%
Total Investment (upper est.)	Annual Benefit (base case)	Base Case Payback	5-Year Net Return	5-Year ROI

The Operational Case

- Eliminates the blind spot on a R6.4M/year water expense
- Automated data flow: meters → dashboard → CLTM ERP
- Real-time leak detection prevents silent water loss
- Operating manual and training for independent operation
- Foundation for portfolio-wide water management

The Strategic Case

- Every month without metering = R302,600 in unrecovered costs
- Municipal tariffs increase annually — shortfall grows
- Usage-based billing is the industry standard
- Metering data supports tenant comms, disputes, board reporting
- Full IP ownership protects investment regardless of circumstances

> **Proceed with the phased deployment.** Begin with the pilot (1 floor) to validate, then roll out to the remaining 11 floors. The investment is justified under any reasonable scenario — even under the most conservative assumptions, the billing improvement alone pays back the investment within 9 months.

12. Next Steps

#	Action	Owner
1	Review and approve this Business Case	Tanya Dowley / Board
2	Confirm meter pricing (volume discount pending from Precision Meters)	Garth Le Roux
3	**Confirm municipal bill composition** (sewage/sanitation tariff structure — see Section 2.1)	Tanya Dowley / Accounts
4	Review Scope of Work and Proposal (to follow)	Tanya Dowley
5	Select pilot floor	Tanya Dowley / Ryan
6	Approve project commencement (pilot phase)	Board
7	Precept Systems initiates platform setup and pilot deployment	Jason van Wyk

Approval

Role	Name	Decision	Signature	Date
Property Management	Tanya Dowley	Approve / Reject		
Board of Directors		Approve / Reject		

Assumptions

This business case is based on the following assumptions. If any prove incorrect, the financial projections should be revised.

#	Assumption	Status
1	Water consumption on the first 12 floors is proportional to their share of the building (44.4%). Actual consumption may differ if floor usage patterns vary.	Assumed
2	The effective all-in rate of ~R114/kL is derived from R1,200,000 ÷ 10,500 kL. Includes all municipal water-related charges.	Assumed
3	**Whether the municipal bill includes consumption-based sewage/sanitation charges needs to be confirmed.** If a significant portion is fixed charges, conservation savings per kL would be lower.	To confirm
4	Conservation savings of 10–25% based on published residential metering studies. Actual results depend on tenant behaviour.	Assumed
5	All 576 units occupied and paying R400/month. Vacancy reduces both costs and revenue proportionally.	Assumed
6	Meter pricing of R2,100 (15mm) and R9,360 (50mm) ex VAT as quoted 3 Feb 2026. Volume discount pending.	Quoted
7	IoT node and infrastructure costs are estimated. Firm pricing in the formal Proposal.	Estimated
8	Platform service hours estimated at R600/hr. Firm pricing in the formal Proposal.	Estimated
9	CLTM ERP supports API integration as confirmed by Sumir (2 Feb 2026). Integration complexity estimated, not scoped in detail.	Confirmed
10	Cloud hosting costs are indicative and depend on provider selection.	Estimated

Sources

Water costs and tariff	Tanya Dowley, site visit 29 January 2026; Mosaic Group records
Building profile and infrastructure	Site visit report, 29 January 2026 (MGW-PRO-202602-001)
Meter pricing	Garth Le Roux, Precision Meters, email 3 February 2026
Conservation studies	General residential metering literature (10–25% reduction commonly cited)
Platform estimates	Precept Systems, based on Fairfield Dairy reference project
ERP integration	Sumir (Mosaic Group IT), email 2 February 2026

Related Documents

Ref	Document	Description
MGW-PRO-202602-001	Site Assessment Report	Site visit findings and building profile
MGW-PRO-202602-003	Scope of Work	Detailed deliverables (TBD)
MGW-PRO-202602-004	Proposal	Commercial terms and pricing (TBD)
MGW-PRO-202602-005	Communications Technology Validation	LoRaWAN selection justification and site-specific RF analysis