MCP SERVER | NO CODE | CLOUD HOSTED

Leak Waste Estimator MCP for AI Agents

Quantifying Municipal Water Loss and Utility Billing Analysis

The Leak Waste Estimator calculates exactly how much water is wasted from different leaks—whether it's a slow drip faucet or a major broken pipe. You input the leak type and rate, and this MCP projects the total volume of lost water in liters across daily, monthly, and yearly scales. It gives you hard numbers on your environmental impact and potential repair costs.

A+ Quality Score 100/100

water-waste | leak-detection | sustainability | utility-management | resource-conservation

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vinkius.com/mcp/leak-waste-estimator

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

Leak Waste Estimator MCP

3 tools available
Cloud-hosted on Vinkius

This connector helps quantify water loss from plumbing fixtures and pipes using specialized models. Instead of just guessing, you get precise figures showing how much waste a leak represents over time. For instance, if you've noticed a dripping faucet, the tool estimates that specific volume of water loss per minute. It also accounts for common household culprits like faulty toilet mechanisms or large, continuous pipe leaks. By projecting these daily losses into monthly and yearly totals, it gives property managers and facility owners clear data points to justify immediate repairs. You can connect this MCP through Vinkius, the #1 catalog, and let your AI client access water waste analysis alongside thousands of other industry tools.

Core Capabilities

01 — Estimate Dripping Faucet Loss

Calculates total water wasted from intermittent leaks like slow drips.

02 — Calculate Toilet Flush Waste

Determines the volume of water lost due to a faulty or overused toilet mechanism.

03 — Model Continuous Pipe Leaks

Calculates extreme water waste from steady, ongoing leaks like broken underground pipes.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/leak-waste-estimator** — connect your AI agent in three steps.

01 You tell your AI client the type of leak and its specific rate (e.g., '20 drops per minute' or '5 liters per hour').

02 The MCP runs this input through three distinct calculation models, each tailored to a different kind of plumbing failure.

03 Your agent returns a clear breakdown: daily loss, monthly total, and annual waste volume in liters.

The bottom line is you get quantified data on water waste, allowing you to prioritize leak repairs based on projected annual cost.

Built For

This MCP is for property managers and facility engineers who deal with large buildings or complex utility infrastructure. If unexpected water loss is affecting your budget or environmental compliance, this tool provides the data you need to prove where repairs must happen first.

Property Manager

Needs to quickly quantify water waste from common sources—like dripping faucets—to justify immediate maintenance spending.

Facility Engineer

Uses the tool to model large-scale, continuous leaks (e.g., broken pipes) and estimate long-term resource depletion.

Utility Consultant

Calculates water waste across different fixture types (toilets vs. faucets) for municipal reporting or efficiency audits.

What Changes When You Connect

01 Pinpoint the exact cost of small leaks. Instead of just noticing a drip, you use `estimate_drip_loss` to see the total annual water waste in liters.

02 Prioritize repairs with certainty. By comparing losses from different sources—like using `estimate_flush_loss` versus running `estimate_steady_flow_loss` —you know where your money is best spent.

03 Create accurate environmental impact reports. You can model a leak's total projected waste, helping you meet sustainability goals with real data.

04 Avoid major billing surprises. Getting reliable estimates lets you budget for water usage and maintenance costs far in advance of the next bill.

05 Understand fixture failures. The tool separates loss types so you know if the problem is routine drip wear or a structural pipe failure.

Real-World Applications

Justifying Major Pipe Repairs

A facility manager suspects underground pipes are leaking badly. They ask their agent to run `estimate_steady_flow_loss` using the measured flow rate. The resulting calculation shows a massive yearly loss, instantly justifying millions in repair funding.

Auditing Guest Bathroom Usage

A hotel needs to curb water waste from toilets. They use `estimate_flush_loss` based on usage patterns and find that even small inefficiencies add up to thousands of liters lost each year, guiding them toward low-flow fixture upgrades.

Calculating Faucet Efficiency

A homeowner notices a slow drip. They use `estimate_drip_loss` with the specific drop rate. The agent calculates that this tiny leak wastes enough water annually to fill over 10,000 bathtubs.

Patterns to Avoid

Assuming all leaks are minor drips

✗ AVOID

A user only runs the drip loss calculation on a pipe leak because it's easier. They underestimate the actual waste volume by ignoring continuous flow rates.

✓ INSTEAD

Always compare results. If you suspect a major issue, run `estimate_steady_flow_loss` first to check for extreme waste before settling on minor sources like those calculated using `estimate_drip_loss`.

Treating toilet and pipe leaks the same

✗ AVOID

A user gets a single total loss number without knowing which mechanism caused it. They can't tell if they need to fix plumbing or just change habits.

✓ INSTEAD

Use the specific tools: run `estimate_flush_loss` for fixture issues, and use `estimate_steady_flow_loss` for pipe integrity failures.

The Right Fit

You should use this MCP if your primary concern is quantifying water loss to justify maintenance or sustainability investments. If you need to know the difference between a slow drip, an inefficient toilet flush, and a major structural break, this tool provides that breakdown. Don't use it if you only need general advice on 'saving water'—you must provide measurable data points (like drops per minute). Also, remember that while `estimate_drip_loss` handles intermittent drips, it won't help with complex system pressure tests; for those, specialized physical testing is required. Use this MCP to calculate the *result* of a leak, not diagnose its root cause.

Quantifying Water Waste from Leaks with Leak Waste Estimator

Traditionally, figuring out water waste means piecing together estimates. You might look at your bill and guess what's wrong, or you might hire an

With this MCP, the process changes completely. Your agent takes specific leak inputs—like a drip rate or flush frequency—and calculates precise

expensive plumber who runs basic flow tests but doesn't give a clear annual projection.

daily, monthly, and yearly totals in liters. You get hard numbers to back up your repair budget.

Water Waste Estimator: Modeling Utility Infrastructure Damage

Before this MCP, assessing total water loss required manually running different formulas for drips versus steady streams. This was slow and often inaccurate because the math varied greatly by fixture type.

Now, you get a consolidated view of potential waste. Whether it's using `estimate_flush_loss` to check fixtures or `estimate_steady_flow_loss` for pipes, the results are immediate, allowing rapid decision-making on resource conservation.

Leak Waste Estimator: 3 Tools for Water Conservation Calculations

These tools let your AI agent quantify water wastage from drips, toilets, or continuous pipe leaks, projecting losses over years.

#	TOOL	DESCRIPTION
01	`estimate_drip_loss`	Determines the total amount of water wasted from intermittent leaks, like dripping bathroom fixtures.
02	`estimate_flush_loss`	Calculates how much water is lost annually due to a malfunctioning or frequently flushed toilet mechanism.
03	`estimate_steady_flow_loss`	Provides an estimate of severe water waste from continuous, non-stop leaks such as burst pipes.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U How much water is wasted if my kitchen faucet drips 15 drops per minute?

💧 **Faucet Leak Estimate**

Based on a drip rate of 15 drops/minute:
- **Daily Loss:** ~1.08 liters
- **Monthly Loss (30 days):** ~32.4 liters
- **Yearly Loss:** ~390 liters

This is the equivalent of losing about a small bathtub's worth of water every few months.

U Estimate total annual waste from my main supply pipe leaking at 4 liters per hour.

⚠️ **Major Pipe Leak Alert**

Running the continuous flow model for 4 L/hr:
- **Daily Loss:** 96 liters
- **Monthly Loss (30 days):** 2,880 liters
- **Yearly Loss:** 34,560 liters

This level of sustained loss requires immediate professional attention to prevent massive utility costs.

U What's the annual waste if my toilets flush accidentally four times a day using 2.5 liter tanks?

Toilet Flush Waste Analysis

Using your usage pattern (4 flushes/day at 2.5 L each):

- **Daily Loss:** 10 liters
- **Monthly Loss:** 300 liters
- **Yearly Loss:** 3,600 liters

Fixing the flushing mechanism alone saves significant water and money over a year.

Frequently Asked Questions

01 **How can I use Leak Waste Estimator MCP to calculate my annual water loss from drips?**

You simply provide the drip rate (e.g., drops per minute). The tool calculates the total waste over a full year, giving you a concrete number of liters lost annually and helping you prioritize repairs.

02 **Does Leak Waste Estimator help me compare different leak types?**

Yes, it's designed for comparison. You can model the annual waste from a dripping faucet using `estimate_drip_loss` and then run `estimate_flush_loss` to see which fixture type contributes the most waste.

03 **Is this tool good for finding hidden, burst pipes?**

It's excellent for modeling continuous leaks. If you know the flow rate of a major pipe leak, using `estimate_steady_flow_loss` gives you an immediate projection of massive annual waste.

04 **What is the biggest factor in calculating water waste with Leak Waste Estimator?**

The most crucial input is accuracy. The higher and more consistent your reported flow rate or drip count, the more accurate the final yearly loss estimate will be for you.

05 **How does this MCP help a property manager justify maintenance spending?**

By providing clear calculations showing that small, ongoing leaks result in thousands of liters of waste annually, it gives management concrete data to support immediate, expensive repairs.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"leak-waste-estimator": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

Leak Waste Estimator is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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