

M C P S E R V E R

N O C O D E

C L O U D H O S T E D

Gas Recycling Optimizer MCP

Manage reservoir pressure and maximize liquid condensate yields.

Gas Recycling Optimizer provides your AI client with the specialized math needed to manage gas condensate reservoirs. It handles the heavy lifting for calculating optimal injection rates, predicting when dry gas will hit production wells, and estimating total liquid recovery based on your specific recycling strategies.

A+ Quality Score 100/100

reservoir

gas

condensate

recycling

petroleum



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.

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.

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.

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

Encryption at rest

Ed25519

PKI vault signatures

24h TTL

Ephemeral session keys

V8 Isolate

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.

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.

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.

06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot 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.

FinOps

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

Firewall & DLP

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

Agent Activity

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

Tool Health

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

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.

Gas Recycling Optimizer MCP

4 tools available

Cloud-hosted on Vinkius

You can use this MCP to run complex reservoir simulations directly through your AI client. Instead of manually calculating pressure buffers or breakthrough windows, you tell your agent the reservoir conditions and it returns the specific rates and timelines you need. It focuses on the critical balance of maintaining pressure above the dew point while avoiding the premature arrival of dry gas at your production wells. You can test different injection volumes to see how they impact your total liquid yields before committing to a field strategy. It turns your AI into a specialized reservoir engineering partner that can validate injection designs and predict recovery efficiency in seconds.

Core Capabilities

01 — Pressure Management

Your agent calculates injection rates to keep reservoir pressure above the dew point.

02 — Breakthrough Prediction

The AI estimates the timing of dry gas arrival at production wells.

03 — Yield Estimation

Your client calculates the total volume of liquid condensate expected from a strategy.

04 — Strategy Validation

The MCP evaluates proposed recycling designs against multiple performance metrics.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/gas-recycling-optimizer — connect your AI agent in three steps.

- 01 Connect your preferred client like Claude or Cursor to Vinkius.
- 02 Provide reservoir parameters like pressure, dew point, and gas composition to your agent.
- 03 The agent calls the specific tool needed for your calculation.
- 04 Receive precise engineering outputs like injection rates or breakthrough timelines.

You connect your AI client to the hosted MCP and start running engineering queries immediately.

Built For

This MCP is built for petroleum engineers and reservoir specialists managing gas condensate assets.

Reservoir Engineer

Hands off complex rate calculations and breakthrough predictions to the AI.

Production Engineer

Uses the tool to validate injection strategies against production well constraints.

Asset Manager

Gets quick estimates on total liquid recovery for field planning.

What Changes When You Connect

- 01 Maintains reservoir pressure above dew point through optimized injection rates.
- 02 Reduces risk of premature dry gas arrival at production wells.
- 03 Provides rapid validation of proposed recycling designs.

04 Estimates liquid condensate yields based on specific injection volumes.

Real-World Applications

Injection Rate Optimization

Find the exact gas volume to inject to maximize recovery while preventing early breakthrough.

Recovery Forecasting

Calculate expected liquid condensate volumes for different reservoir management scenarios.

Breakthrough Risk Assessment

Predict when injected gas will reach production wells based on well spacing and injection rates.

Design Validation

Run a full assessment of a recycling strategy using combined rate and recovery metrics.

4 Tools Available

#	TOOL	DESCRIPTION
01	calculate_condensate_recovery	This tool estimates the total volume of liquid condensate you can recover using a specific recycling strategy.
02	evaluate_recycling_strategy	Use this to get a full assessment of a proposed recycling design by combining rate, breakthrough, and recovery metrics.
03	get_optimal_recycling_rate	This tool determines the most efficient gas injection volume to maximize recovery without causing early breakthrough.
04	predict_breakthrough_time	This tool estimates exactly when injected dry gas will reach your production wells.

See It in Action

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

U What is the best injection rate for a reservoir at 4500 psi with a dew point of 4200 psi and a rich gas composition?



The optimal injection rate is 12.5 MMSCF/D, providing a pressure buffer of 300 psi and an efficiency index of 0.85.

U Will a recycling rate of 15 MMSCF/D cause early breakthrough if the wells are 500 meters apart?



The estimated time until breakthrough is 4.2 years, with a breakthrough risk factor of 0.15.

U Estimate the total condensate recovery for a rate of 10 MMSCF/D with a maintenance factor of 0.8.



The total recovered volume is estimated at 1,250,000 barrels with a recovery efficiency of 78%.

Frequently Asked Questions

01 What can this MCP do for reservoir management?

It calculates optimal gas recycling rates, predicts dry gas breakthrough times, and estimates total condensate recovery.

02 Which AI clients can use this MCP?

You can use this MCP with any compatible client, including Claude, Cursor, Windsurf, and VS Code.

03 How does it help prevent early breakthrough?

The tool calculates the optimal injection rate to maximize recovery while ensuring the dry gas does not reach production wells too early.

04 Do I need to host the MCP myself?

No, Vinkius hosts and manages the MCP for you. You just connect your client and start working.

05 Can I validate a specific injection design?

Yes, you can use the `evaluate_recycling_strategy` tool to check if a proposed rate and design are viable for your reservoir conditions.

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 <code>"gas-recycling-optimizer": { "url": "..." }</code>
 Windsurf	MCP Settings → <code>mcp_settings.json</code> → 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

Gas Recycling Optimizer 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

INDEPENDENT PLATFORM DISCLAIMER

Vinkius is an independent platform and is not affiliated with, endorsed by, sponsored by, verified by, or otherwise authorized by Gas Recycling Optimizer. All third-party trademarks, logos, and brand names are the property of their respective owners. Their use in this document is strictly for informational purposes to identify service compatibility and interoperability.

DOCUMENT INFORMATION

Generated	September 2026
MCP Server	Gas Recycling Optimizer MCP
Server ID	01a09ae6-5d94-7332-91c1-2b7dd675db3f
Platform	Vinkius Cloud for AI Agents
Endpoint	<code>https://edge.vinkius.com/{token}/mcp</code>

LICENSE & USAGE

This document is generated automatically by the Vinkius PDF Engine. Content reflects the MCP server configuration at the time of generation and may change as updates are deployed. For the most current information, visit vinkius.com/en/ai-agent-connect/gas-recycling-optimizer.