

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 Coning Model MCP

Manage gas breakthrough risks and optimize well production rates.

Gas Coning Model MCP gives reservoir engineers the math needed to handle gas coning risks. Your AI client uses these tools to calculate safe production limits, predict when gas will hit the wellbore, and model gas-oil ratio trends to keep production stable.

**A+**

Quality Score 100/100

reservoir

coning

petroleum

production

simulation



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

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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

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## 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

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## 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

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## 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](https://cloud.vinkius.com) — connect your AI agent in under 60 seconds.

# Gas Coning Model MCP

4 tools available

Cloud-hosted on Vinkius

You can use this MCP to manage the technical risks associated with gas coning in oil reservoirs. Instead of running manual calculations, you ask your AI client to handle the heavy lifting for reservoir management. It helps you determine the exact point where production rates become unsafe, potentially leading to premature gas breakthrough. You can simulate how gas-oil ratios will change over time or test different well placements to see how anisotropy and reservoir thickness impact your risk profile. It turns complex reservoir physics into direct answers for your production planning.

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## Core Capabilities

### 01 — Critical Rate Calculation

Your agent calculates the safe production ceiling to prevent gas coning.

### 03 — GOR Modeling

Your agent simulates how the gas-oil ratio changes over the life of the well.

### 02 — Breakthrough Forecasting

Your AI client estimates the time remaining before gas reaches the wellbore.

### 04 — Placement Optimization

Your AI client evaluates well locations based on reservoir anisotropy and thickness.

# One Click on Vinkius — From Prompt to Execution

Available at [vinkius.com/en/ai-agent-connect/gas-coning-model](https://vinkius.com/en/ai-agent-connect/gas-coning-model) — connect your AI agent in three steps.

- 01

Connect your AI client to the Vinkius hosted MCP.
- 02

Provide reservoir parameters like permeability and thickness to your agent.
- 03

Ask the agent to run specific calculations like critical rate or breakthrough time.
- 04

Receive direct, calculated results from your AI client.

Connecting this MCP to your AI client gives you immediate access to reservoir modeling tools.

## Built For

This MCP is built for petroleum engineers working with gas cap reservoirs. You can hand off the mathematical modeling and simulation tasks to your AI agent.

### Reservoir Engineer

Uses the MCP to model gas coning risks and optimize production rates.

### Production Engineer

Uses the tool to monitor GOR trends and manage breakthrough timing.

### Petroleum Engineer

Uses the MCP to evaluate well placement and completion strategies.

## What Changes When You Connect

- 01

Reduces manual math for critical rate calculations.
- 02

Provides time-to-breakthrough estimates for production planning.
- 03

Models GOR trends to predict reservoir behavior.

**04** Assists in well design by evaluating anisotropy impacts.

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## Real-World Applications

### Preventing Gas Breakthrough

Calculate the maximum safe rate to avoid early gas coning in a new well.

### Production Forecasting

Model the GOR evolution to prepare for changing fluid ratios over time.

### Well Placement Planning

Test how different perforation depths and locations affect coning risk.

### Risk Assessment

Estimate the days remaining until gas reaches the wellbore at current rates.

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## 4 Tools Available

| #  | TOOL                    | DESCRIPTION                                                                                                                                                        |
|----|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01 | calculate_critical_rate | This tool finds the maximum production rate you can maintain without triggering gas coning. It provides the specific threshold to keep gas breakthrough at bay.    |
| 02 | evaluate_well_placement | This tool analyzes how different well completion locations affect coning risks. It accounts for reservoir thickness and anisotropy to help you pick the best spot. |
| 03 | predict_breakthrough    | This tool estimates the timeframe for gas reaching the wellbore. It gives you a window of time before gas breakthrough occurs based on your current production.    |
| 04 | simulate_gor_evolution  | This tool models the progression of the gas-oil ratio throughout the production lifecycle. It shows how the GOR will trend as you produce from the reservoir.      |

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## 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 critical production rate for a reservoir with 100m horizontal permeability, 20m vertical permeability, 50m oil thickness, 30m gas cap, and 10m perforation depth?



The calculated critical rate is 450.5 bbl/day with an anisotropy ratio of 0.2.

**U** If I produce at 500 bbl/day with a critical rate of 450 bbl/day, when will gas breakthrough occur?



Breakthrough is expected in 120 days with an Immediate severity level.

**U** Show me the GOR evolution for a production rate of 400 bbl/day and a critical rate of 450 bbl/day over 10 steps.



The GOR remains stable at 15.0 for all 10 time steps as the production rate is below the critical rate.

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## Frequently Asked Questions

### 01 What can this MCP do for reservoir engineers?

It provides tools to calculate critical production rates, predict gas breakthrough timing, model GOR evolution, and evaluate well placement.

### 02 How do I use this with Claude or Cursor?

You connect your client to Vinkius once, and the tools become available as functions your agent can call directly within your existing workflow.

**03 Does this MCP handle anisotropy?**

Yes, the evaluate\_well\_placement tool uses reservoir anisotropy and thickness to help optimize well design.

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**04 Can I predict when gas will hit my well?**

Yes, you can use the predict\_breakthrough tool to estimate when gas will first reach the wellbore.

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**05 Is the GOR modeling real-time?**

The simulate\_gor\_evolution tool models the progression of the gas-oil ratio over a production lifecycle based on the parameters you provide.

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# Go Live in 60 Seconds

Get your connection token from [cloud.vinkius.com](https://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-coning-model": { "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 Coning Model is live on Vinkius Cloud.

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

**Start at [cloud.vinkius.com](https://cloud.vinkius.com) →**

[vinkius.com](https://vinkius.com) · [support@vinkius.com](mailto:support@vinkius.com)

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**DOCUMENT INFORMATION**

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