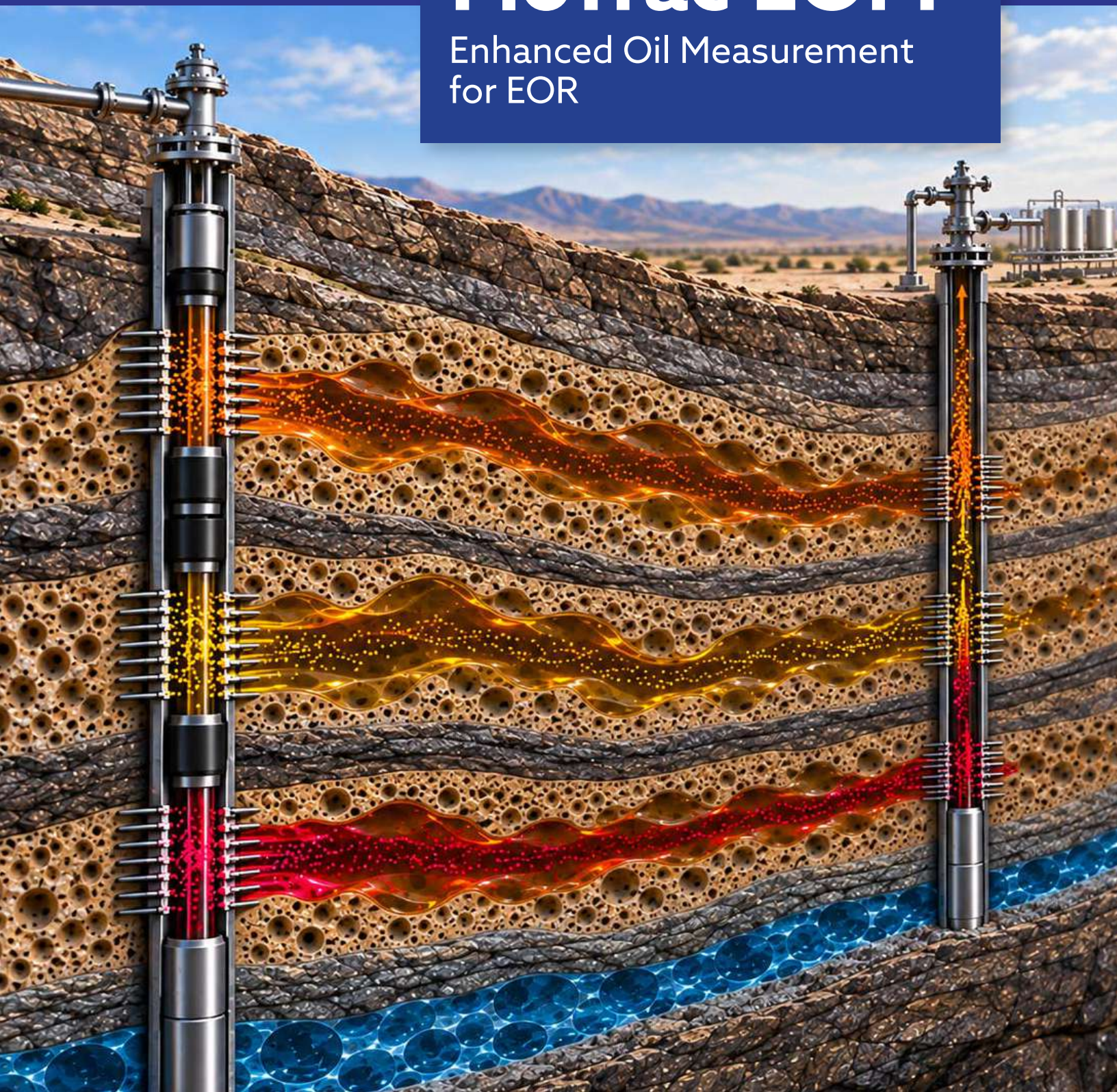
QuantumPro, Inc.

FloTrac EOM™

Enhanced Oil Measurement for EOR



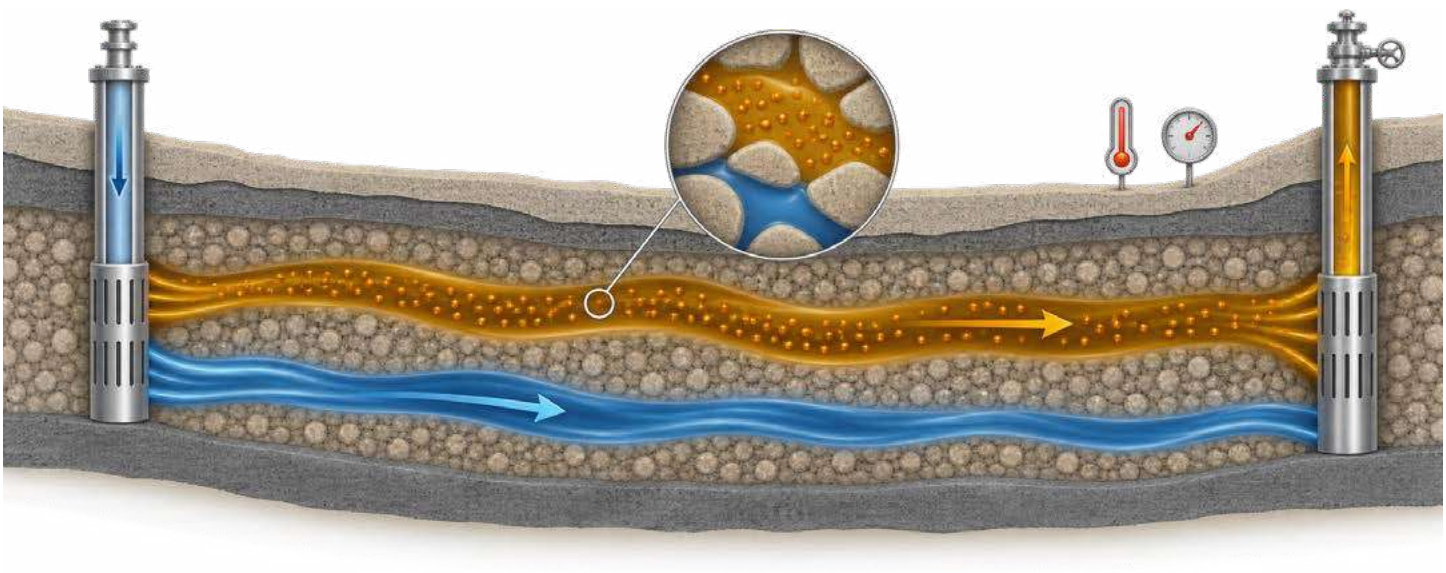
Trace the reservoir oil. Quantify the uplift. Optimize the IOR/EOR decisions.

An IOR/EOR program succeeds or fails based on incremental oil recovery and a favorable return on the cost of producing it. Yet most operators evaluate the value of that investment with a single aggregated metric, the total oil rate at the wellhead before and after the treatment. Rate went up. Good. But which treated interval delivered it?

Where did the fluid actually go, and what got bypassed? Did the surfactant reach the zone you paid to contact, or did it run down a thief channel and out the producer? Is the uplift real and durable, or is it a decline-curve artifact that will vanish in ninety days?

These are not academic questions. They decide chemical types, volumes, injection allocation, conformance spend, pattern spacing, field development plans, and whether you scale the technology across the field or quietly shelve it.

Conventional chemical tracer diagnostics follow the injected phase. That tells you where the water or chemical went, useful, though it stops one step short of the question your production uplift quantification and economics turn on. **FloTrac EOM™ follows the hydrocarbon with unprecedented portfolio of 220 unique nanoparticle tracers.**



Direct hydrocarbon tracking: Proof of oil movement, not a proxy

FloTrac EOM™ is an engineered nanoparticle tracer platform from QuantumPro, Inc., designed to remain associated with the oil phase and produce back with the mobilized hydrocarbons at the most challenging HTHP reservoir conditions. The flow diagnostic tracer response is no longer a proxy for injected fluid movement; it becomes evidence of oil movement.

Assign a unique nanoparticle signature to a zone, stage, reservoir sector, or event. Then, read the produced response against oil rate, water cut, far-field and near-wellbore flowing history, and injection allocation. The result is a direct line from the reservoir volume you treated to the oil you produce.

Your Question	What FloTrac EOM™ Measures	The Decision It Enables
Where is the produced oil coming from?	Relative response by unique tracer and interval	Zonal allocation and selective intervention
Did the treatment create uplift?	Tracer response aligned with oil-rate change	Tracer response aligned with oil-rate change
Which flow paths dominate?	Arrival time, peak amplitude, curve shape, persistence	Identify preferential pathways and channeling
How much of the reservoir is contributing?	Response distribution and temporal behavior	Assess effective drainage and SRV contribution
Where is sweep weak?	Where is sweep weak?	Target bypassed and under-contacted oil
How should the next job change?	Integrated tracer, production, and injection interpretation	Optimize dose, placement, pattern, economics

The Engineered Particle Behind the Unique Diagnostic



FloTrac EOM™ nanoparticle tracers are solid, inert, non-radioactive, non-hazardous, and surface-engineered to resist reaction with reservoir rock and in-situ fluids. The tracers arrive pre-mixed, require no dedicated handling or blending onsite, and generate flowback and samples free from permitting, special handling, or disposal controls that radioactive or toxic tracer chemistries demand.

The nanoparticle tracers' inert nature eliminates the failure modes that distort conventional chemical tracer diagnostics. Chemical tracers often adsorb onto rock surfaces at large quantities, stripping away mass from the signal and skewing reservoir flow and production allocation. Liquid tracers can also disperse or solubilize prematurely, within days or generate false positives during inter-well communication events.

In contrast, FloTrac EOM™ nanoparticle tracers stay intact, withstand reservoir temperatures of 2,000° F and pressures to 10,000 psi, and remain detectable across monitoring windows measured in months or years rather than weeks.

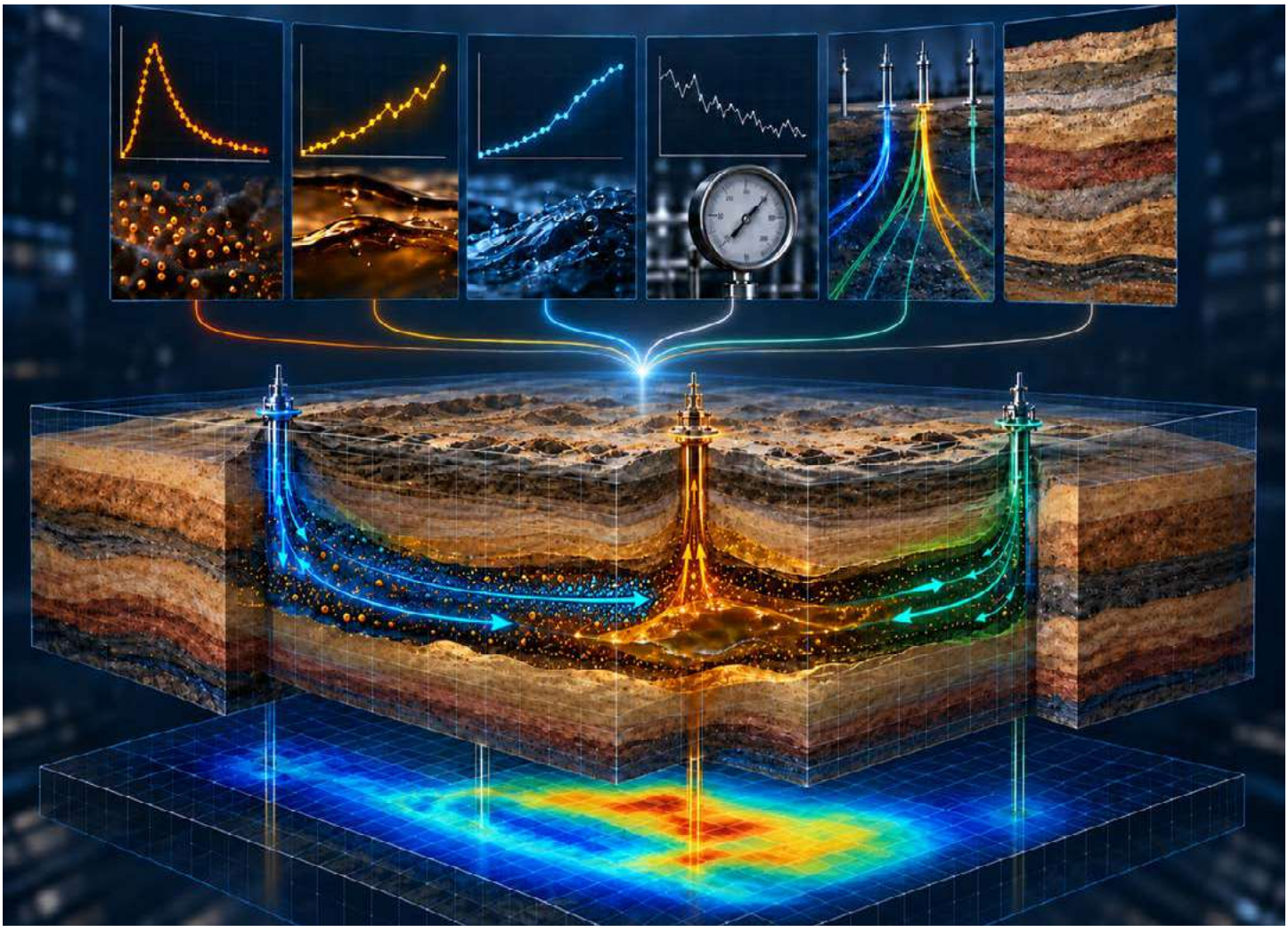
Identification is physical sub-atomic rather than chemical. Each distinct signature features deliberate compositional variations identified via high-energy sub-atomic X-ray spectroscopy down to parts-per-billion (ppb) sensitivity. By reading each tagged signature independently, zonal contribution resolves without ambiguity. The result is flow surveillance that is far more granular, higher resolution, sustained over longer time horizons, and delivered at a lower cost than legacy tracer programs.

The FloTrac EOM™ nanoparticles preferentially associate with and travel within the liquid hydrocarbon phase, flowing strictly with produced oil to isolate the exact intervals driving your oil cut rather than the water cut. Tracer recovery volume is tied purely to hydrodynamic fluid transport rather than downhole dissolution rates.

Field Implementation: How the Diagnostic Is Deployed and Interpreted

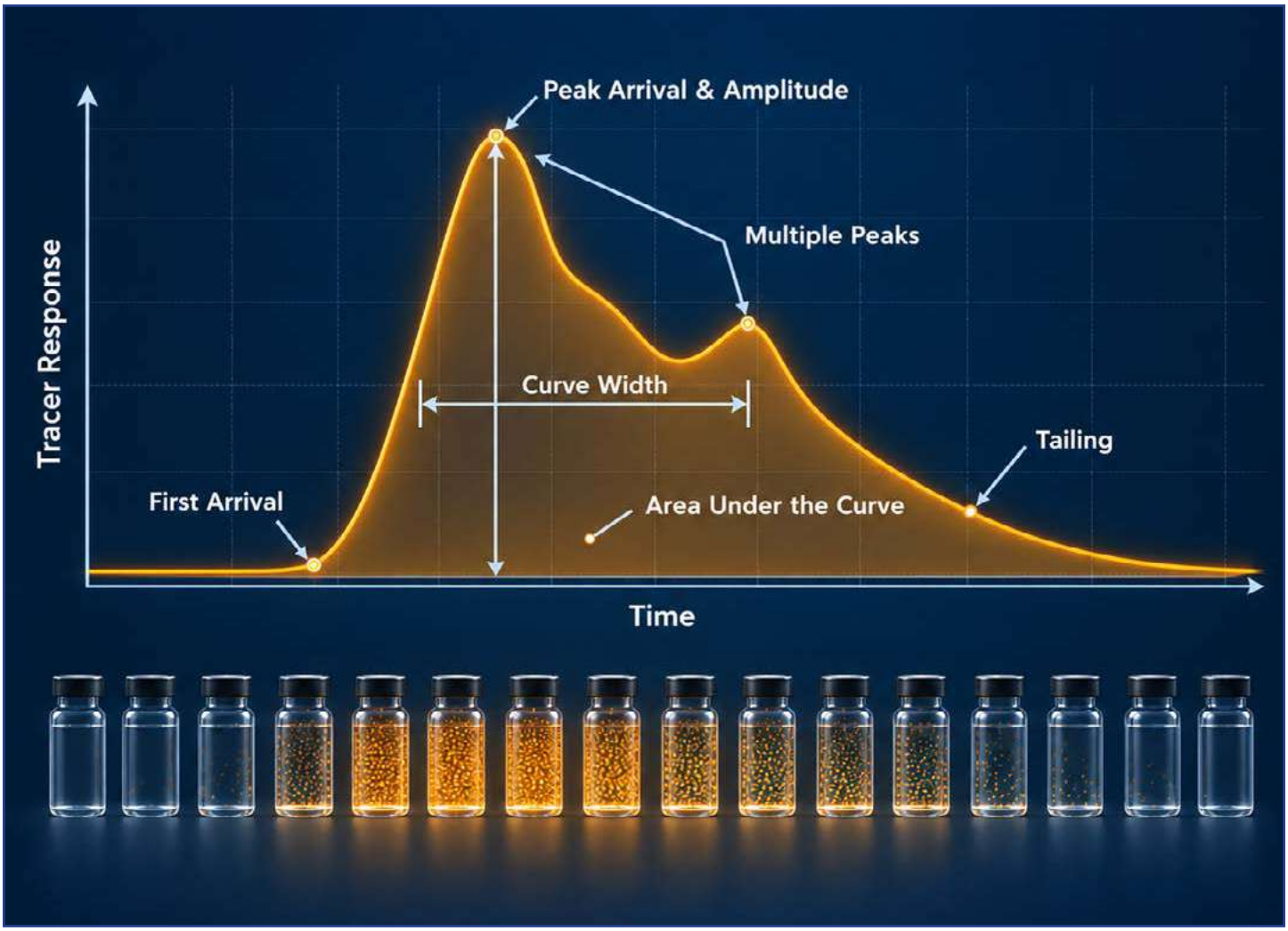
Deploying the FloTrac EOM™ surveillance platform follows a structured progression from early design through final field decisions.

- **Design:** Define the primary reservoir objective. Frame the operational hypothesis, assign unique nanoparticle tracers by zone or event, estimate the transport window, and establish sampling frequency.
- **Deploy:** Inject or co-inject the tracer so its starting point ties directly to a specific zone, stage, reservoir sector or EOR treatment.
- **Detect:** Collect time-series fluid samples at offset producers and surface facilities. Isolate and quantify each unique nanoparticle signature.
- **Interpret:** Characterize breakthrough time, peak arrival, response amplitude, curve breadth, tailing behavior, and cumulative mass recovery.
- **Integrate:** Correlate tracer response curves against oil production rates, water cut, flow pressure history, injection allocation, timing, geology, and simulation models.
- **Decide:** Execute data-driven interventions. Reallocate injection volumes, adjust chemical concentration, prioritize pattern conformance treatments, and scale investments where performance is verified.



For FloTrac EOM™, the breakthrough curve provides a time-resolved fingerprint of hydrocarbon transport through reservoir rock. Rather than inferring fluid movement from water cuts, each feature of the response curve delivers specific diagnostic evidence:

- **First Arrival:** Confirms direct connectivity and establishes minimum fluid transit time.
- **Peak Arrival and Amplitude:** Identifies dominant flow pathways, the degree of fluid dispersion, and the concentration of flow along the preferred pathways.
- **Curve Width:** Reflects reservoir heterogeneity, multiple flow paths, storage effects, matrix interaction, and fracture network complexity.
- **Tailing:** Indicates matrix-to-fracture diffusion, delayed release from low-permeability rock, or a broad residence-time distribution.
- **Area Under the Curve:** Quantifies cumulative tracer mass recovery to verify relative volumetric contribution across tagged zones.
- **Multiple Peaks:** Layered reservoir communication, discrete high-permeability thief conduits vs. expected matrix lag, crossflow, or dynamic allocation shifts.



Sweep, Channels, and Bypassed Pay

- **Fast, High Amplitude Response:** Identifies dominant conduits—fractures or high-permeability thieves with minimal matrix dispersion.
- **Broad, Distributed Response:** Suggests volumetric sweep, wider contribution and a healthy residence-time distribution.
- **Weak or Absent Response:** Flags poor connectivity, bypassed pay, out-of-zone fluid loss, or transport times extending beyond the monitoring window.
- **Post-Treatment Redistribution:** Delivers physical, direct proof that a conformance gel or diverter job successfully shifted fluid allocation away from thief zones and into unswept rock.



Polymer Flooding: Verifying Mobility and In-Situ Placement

Traditional diagnostics track where the polymer went. FloTrac EOM™ proves what the polymer mobilized.

- **Track the Flood Front:** Map polymer-bank advance and front velocity through paired tracer response curves.
- **Pinpoint Thief Conduits:** Identify high-permeability bypass channels driving premature chemical breakthrough and wasted chemical.
- **Verify Low-Permeability Placement:** Confirm whether tighter, unswept zones are being contacted and drained.
- **Quantify Conformance Remediation:** Compare baseline and post-treatment response to verify improvements in sweep efficiency.
- **Corroborate In-Situ Degradation:** Match mechanical shear, thermal degradation, salinity shifts, and retention loss against fluid rheology data.
- **Optimize Slug Sizing:** Allocate injection volumes and chemical concentrations based on empirical sweep metrics to eliminate over-injection and maximize incremental-oil economics.

FloTrac EOM™

Enhanced Oil Measurement for EOR

To learn more about how **FloTracEOM™** can remove barriers to discrete production flow performance analysis contact **QuantumPro, Inc.**

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