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Petroleum AI Field Report

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Use case: Product tax and jurisdiction coding checks

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Bottom line

Most tax-coding errors at a fuel distributor are not judgment calls. They are a wrong product code, a wrong delivery jurisdiction, or a lapsed exemption certificate on a line that could have been caught before the invoice went out. That is rules work, not AI. Statistics can rank which exceptions to look at first, and generative AI can read certificates and rate notices into structured fields for a person to check. The quickest win is a nightly exception report on invoice lines you already have. Federal dyed diesel penalty relief runs Oct 1 through Dec 31, 2026, so any dyed-on-highway rule needs a dated exception that ends with it.

THE OPERATOR PROBLEM

Every gallon on an invoice carries a stack of taxes and fees set by three facts: what the product is (clear or dyed diesel, gasoline, kerosene, propane, lubricants), where it was delivered or where title passed, and who the customer is (resale, government, farm, off-road, on-road). Get one fact wrong and the tax lines are wrong.

The federal layer alone has traps. Form 720 instructions (rev. 06/2026) tax gasoline at $0.1840/gal and diesel and kerosene at $0.2440/gal, both including the $0.0010/gal LUST rate (IRS Instructions for Form 720 (https://www.irs.gov/instructions/i720); 26 U.S.C. 4081 (https://www.law.cornell.edu/uscode/text/26/4081)). Under section 4082(a), diesel is exempt from the section 4081 tax when it is indelibly dyed and destined for a nontaxable use, but the LUST rate still applies to it (26 U.S.C. 4082(a) and (f) (https://www.law.cornell.edu/uscode/text/26/4082)).

The state layer adds more. Colorado posts, for October 2026 through June 2027: gasoline $0.2200/gal, special fuel $0.2050/gal, road usage fee $0.0600/gal on both, a bridge and tunnel impact fee of $0.0600/gal on special fuel only, and an environmental response surcharge of $0.0094/gal (posted as $0.009375) (Colorado DOR fuel tax and fee rates (https://tax.colorado.gov/fuel-tax-and-fee-rates)). Colorado also exempts fuel from state sales tax only when the excise was charged and collected, and home-rule cities administer their own sales taxes (Colorado DOR, Gasoline and Special Fuels (https://tax.colorado.gov/sales-use-tax-topics-gasoline-special-fuels)).

Interpretation: the common failures are a tank wagon ticket coded clear when the meter pumped dyed, a new ship-to set up with the billing address jurisdiction, a farm or government certificate that expired, and a rate table that missed an effective date. The cost shows up as under-collected tax you absorb at audit with penalty and interest, over-billing that customers catch, and amended returns.

WHAT ACTUALLY DOES THE WORK

- Plain rules (not AI), most of the value. Product-to-tax-code mapping, delivery-point jurisdiction lookup, certificate on file and unexpired, rate effective-date check. Examples: dyed diesel line carrying the $0.2440/gal federal diesel tax; clear diesel line with no federal tax and no exemption on file; special fuel line in Colorado with no bridge and tunnel fee.
- Statistics. Flag effective tax per gallon that drifts from the same customer, product and jurisdiction history. Useful for ranking the review queue, not for deciding the answer.

- Generative AI. Read exemption certificates and state rate notices into fields (customer, type, jurisdiction, expiration) and write a one-line explanation of each flag. A person checks every extraction against the original document.
- Optimization. Not needed for this use case.

DATA REQUIRED AND WHERE IT LIVES

- ERP or billing system: invoice lines, product master with tax codes, customer master tax status, ship-to addresses, rate tables.
- Exemption certificates: usually PDFs in email, a shared drive, or attached to the customer record.
- Terminal and BOL data: product as loaded. Terminal operators report every receipt and disbursement monthly to the IRS on Form 720-TO through ExSTARS, so the terminal's product classification is upstream evidence (IRS ExSTARS (https://www.irs.gov/businesses/small-businesses-self-employed/excise-summary-terminal-activity-reporting-system-exstars)).
- Delivery tickets and telematics: GPS drop location to check the ship-to jurisdiction.
- Cardlock network: site location for jurisdiction on unattended sales.
- State return codes: FTA product and schedule codes used on uniform state forms and EDI (FTA Uniformity Guide, updated June 2026 (https://taxadmin.org/wp-content/uploads/resources/motor-fuels/11-point-plan-uniformity-guide_june2026final.pdf)).

BUILD, BUY, OR CONFIGURE WHAT YOU OWN

- Configure what you own. Most fuel ERPs already hold tax tables and can run a saved query. A nightly report of lines that break the rules above costs staff time, not license fees.
- Buy. Avalara claims its excise products calculate energy excise and sales tax, keep rates, rules and forms updated, and prepare motor fuel returns across the U.S. and Canada (Avalara excise tax page (https://www.avalara.com/us/en/products/excise-tax.html); vendor claims). A PDI datasheet for its Avalara motor fuel returns product claims it tracks rule, rate and form changes and builds signature-ready returns from ERP data (PDI MFTR Avalara datasheet (https://pditechnologies.com/wp-content/uploads/2023/10/PDI-Motor-Fuel-Tax-Return-Avalara-Datasheet.pdf), copyright 2022; vendor claims).
- Build. A small SQL or Python rule set against an invoice export. Add statistical scoring only after you have a few months of reviewed flags.

Interpretation: buy or subscribe for rate content if you file in many states, because keeping rates current is the hard part. Build or configure the exception layer yourself, because it depends on your product master and customer setup.

A 30-DAY PILOT

- Scope: one state, clear and dyed diesel plus gasoline, one branch's invoices.
- Week 1: write 8 to 10 rules and back-test them on last month's posted invoices.
- Weeks 2 to 4: run nightly on new invoices before release.
- Human review point: the billing or tax clerk clears each flag before the invoice is released or a credit memo is issued. The controller signs off any correction.

- Measure: review minutes per day against your current spot-check time, flags confirmed as real errors, false alarms, and tax dollars corrected from your own records.
- Stop condition: if more than half the flags are still false alarms after week 2 tuning, or review takes longer than today's spot checks, stop and fix master data first.

CONTROLS AND FAILURE MODES

- Audit trail: keep every flag, reviewer, decision, timestamp and rule version.
- Permissions: one owner changes rules and rate tables; clerks who clear flags cannot edit them.
- Sign-off: the controller or tax lead approves each rate table change on its effective date; the return preparer approves any amendment.
- Never automated: changing a customer's exempt status, changing a rate, deciding whether a use is taxable, and filing or amending a return.
- Failure modes: a stale rate table makes every rule agree with the wrong answer; bad ship-to geocodes pass the jurisdiction check; generative AI misreads a certificate expiration date; too many false alarms and clerks stop reading.

CURRENT DEVELOPMENT: FEDERAL DYED DIESEL RELIEF

IR-2026-122 (Oct 14, 2026) says the IRS will not impose a penalty when dyed diesel is sold for use or used on highways, retroactive to Oct 1, 2026 and in effect until Dec 31, 2026. It applies for federal purposes only and has no effect on state fuel taxes or penalties (IR-2026-122 (https://content.govdelivery.com/accounts/USIRS/bulletins/42f35cd)). The IRS FAQ (Oct 23, 2026) says dyed diesel sold during the relief period need not be reported on Form 720, including the fourth-quarter return; the relief does not cover clear diesel or dyed kerosene; "nontaxable use only" notices must be restored when the relief ends; and residual red dye guidance is still to come (IRS dyed diesel FAQ (https://www.irs.gov/newsroom/dyed-diesel-frequently-asked-questions)).

Interpretation: any rule that flags dyed diesel on highway needs a dated federal exception that expires Dec 31, 2026, while state rules stay as they are. This matches the Nov 3 Compliance Deadline Radar.

DEEPER READS

- https://taxadmin.org/wp-content/uploads/resources/motor-fuels/11-point-plan-uniformity-guide_june2026final.pdf

FTA Motor Fuels Tax Section, 11 Point Plan Uniformity Guide (updated June 2026): product codes, schedule codes and EDI standards for state returns.

- https://www.irs.gov/instructions/i720

IRS Instructions for Form 720 (rev. 06/2026): federal rates and IRS numbers for each fuel line.

- https://tax.colorado.gov/sales-use-tax-topics-gasoline-special-fuels

Colorado DOR, Sales and Use Tax Topics: Gasoline and Special Fuels: how excise and sales tax interact.

Not legal or tax advice; confirm applicability with your tax advisor or the issuing agency.

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